2011-2012
Graduate Course Catalog

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Academic Calendar

2011-12

Fall Semester

Classes Begin	Aug 22
Labor Day Holiday	Sept 5
Veterans Day Holiday	Nov 11
Thanksgiving Vacation	Nov 23-24
Final Examinations, Monday through Friday	Dec 12-16
Final Grades, due 5PM	Dec 20

Spring Semester

Classes Begin	Jan 9
Martin Luther King Jr. Day	Jan 16
President's Day	Feb 20
Spring Vacation	Mar 12-16
Final Examinations, Monday through Friday	Apr 30-May 4
Commencement	May 5
Final Grades, due 5PM	May 8

Summer Session

Early Session Begins	May 7
Memorial Day	May 28
Eight-Week Session	June 4
Late Six-Week Session	June 18
Independence Day	July 4
Summer Session Ends	July 27
Final Grades, due 5PM	July 31

Administration of Washington State University

Executive Officers

Elson S. Floyd, President
Warwick Bayly, Provost and Executive Vice President

Board of Regents

www.regents.wsu.edu

WSU Administration

http://publishing.wsu.edu/mailing-services/admin.html

Chancellors

Vicky Carwein	Chancellor, WSU Tri-Cities
Lynn Valenter	Interim Chancellor, WSU Vancouver
Brian Pitcher	Chancellor, WSU Spokane

Academic Deans

Daniel J. Bernardo	College of Agricultural, Human, and Natural Resource Sciences
Patricia Butterfield	College of Nursing
Candis Claiborn	College of Engineering and Architecture
Daryll DeWald	College of Sciences
Doug Epperson	College of Liberal Arts
Howard Grimes	Graduate School and Office of Research
Lawrence Pintak	Murrow College of Communication
Gary Pollack	College of Pharmacy
A.G. Rud	College of Education
Bryan Slinker	College of Veterinary Medicine
Eric Spangenberg	College of Business
Jay Starratt	Libraries
Mary Wack	University College
Libby Walker	University Honors College

Graduate Education at Washington State University

Washington State University, the State of Washington's land-grant institution, was founded in 1890. The first class of twenty-one students enrolled on January 13, 1892. Since that time, the University has grown steadily in size and diversity. It now contains 11 colleges and a Graduate School, with a total enrollment for all campus locations of over 20,000. The main campus of nearly 600 acres, located at Pullman in the Palouse country of southeastern Washington, encompasses one of the largest residential universities west of the Mississippi. More than 80 per cent of all students live on or near campus. In addition to the main campus, Washington State University offers courses of study at three regional campuses located in Spokane, Tri-Cities (Richland), and Vancouver. In addition, the University maintains over 5,000 acres of farmland and eight agricultural research centers located at various points in the state.

Washington State University offers more than 70 degree programs. Permanent tenure-track faculty number over 1,000 and approximately 70 percent of all full-time graduate students hold positions as teaching, research, and/or staff assistants.

Today, the Dean of the Graduate School administers the diverse graduate programs throughout the University, but the faculty is primarily responsible for directing graduate education. The Graduate Studies Committee of the Faculty Senate, composed of faculty members and graduate students, assists the Graduate School in the establishment of the policies and procedures of the Graduate School.

The Graduate School is committed to helping graduate students become learned scholars, effective researchers, and masters of disciplinary and interdisciplinary knowledge. WSU faculty emphasizes independent scholarship, research, and classroom learning. State-of-the-art equipment is present in the research centers and academic departments to help students conduct their research. Close research collaboration between students and faculty helps to create an atmosphere that stimulates intellectual curiosity. The individualized nature of graduate education at Washington State University also provides student with considerable flexibility in designing programs of study, and broadens the possibilities for unique creative endeavors.

The Graduate School may be contacted at:
PO Box 641030
Pullman, WA 99164-1030
509-335-6424
Email: gradsch@wsu.edu
www.gradschool.wsu.edu

Graduate Degrees

Doctor of Philosophy

Agricultural Economics
American Studies
Animal Science
Anthropology
Biological and Agricultural Engineering
Biology
Botany
Business Administration
Chemical Engineering
Chemistry
Civil Engineering
Communication
Computer Science
Criminal Justice
Crop Science
Economics
Education
Electrical and Computer Engineering
Engineering Science
English
Entomology
Environmental and Natural Resource Sciences
Food Science
Geology
History
Horticulture
Individual Interdisciplinary Doctoral Program
Materials Science and Engineering
Mathematics
Mechanical Engineering
Molecular Biosciences
Molecular Plant Sciences
Neuroscience
Nursing
Nutrition
Pharmaceutical Sciences
Physics
Plant Pathology
Political Science
Psychology
Sociology
Soil Science
Veterinary Science
Zoology

Master of Arts

American Studies
Anthropology
Apparel, Merchandising, and Textiles
Communication
Criminal Justice (S)
Education (S, V, T)
English
Foreign Languages and Cultures
History (V)
Human Development
Interior Design (S)
Music
Philosophy
Political Science
Sociology
Speech and Hearing Sciences (S only)

Master of Business Administration

Master of Business Administration (V, T)
Master of Business Administration Executive Program (S)

Master of Science

Agriculture
Animal Science
Applied Economics
Architecture (S)
Biological and Agricultural Engineering
Biology (T)
Botany
Chemical Engineering
Chemistry (T)
Civil Engineering
Computer Engineering
Computer Science (V, T)
Crop Science
Electrical Engineering (S, T)
Engineering
Entomology
Environmental Engineering (T)
Environmental Science (V,T)
Exercise Science (S only)
Food Science
Geology
Horticulture
Human Nutrition
Landscape Architecture (S)
Materials Science and Engineering
Mathematics
Mechanical Engineering (V,T)
Molecular Biosciences
Molecular Plant Sciences
Natural Resource Sciences
Neuroscience
Pharmaceutical Sciences
Physics
Plant Pathology
Professional Science Masters
Psychology
Soil Science
Statistics
Veterinary Science
Zoology

Professional Schools

Pharmacy
Veterinary Medicine

Specialty Degrees

Master in Teaching (S,V,T)
Master of Accounting (V)
Master of Architecture (S)
Master of Education (S,V,T)
Master of Engineering and Technology Management (S,V,T only)
Master of Fine Arts
Master of Health Policy and Administration (S only)
Master of Nursing (V,T)
Master of Public Affairs (V only)
Doctor of Design (S only)
Doctor of Education (S,V,T)

Certificates

Graduate Certificate in Agribusiness
Graduate Certificate in Bioethics
Graduate Certificate in Biotechnology Management
Graduate Certificate in Constraints Management
Graduate Certificate in Construction Project Management
Graduate Certificate in Early Childhood Leadership and Administration
Graduate Certificate in Engineering Nanotechnology
Graduate Certificate in Exercise Science
Graduate Certificate in Family Nurse Practitioner
Graduate Certificate in General Engineering Management
Graduate Certificate in Global Justice and Security Studies
Graduate Certificate in Health-Assistive Smart Environment Design
Graduate Certificate in Interdisciplinary Environmental Biogeochemistry
Graduate Certificate in Manufacturing Leadership
Graduate Certificate in Molecular Biosciences
Graduate Certificate in Nuclear Engineering
Graduate Certificate in Nurse Educator
Graduate Certificate in Project Management
Graduate Certificate in Protein Biotechnology
Graduate Certificate in Psychiatric Mental Health Nurse Practitioner
Graduate Certificate in Reproductive Biology
Graduate Certificate in Six Sigma Quality Management
Graduate Certificate in Supply Chain Management
Graduate Certificate in Sustainable Agriculture
Graduate Certificate in Systems Engineering Management

Distance Degree Programs

Agriculture M.S.
Engineering and Technology Management, M.E.T.M Graduate Certificate
Master of Business Administration
Master of Business Administration Executive Program

Interdisciplinary Opportunities

Biotechnology
Clean Technology
Environmental Research
Materials Science and Engineering
Molecular Plant Sciences
School for Global Animal Health

Key: (S) Spokane
(V) Vancouver
(T) Tri-Cities

Student Services

Facilities

Libraries

The Libraries system is an integral part of WSU's educational resources. The Libraries' collection contains in excess of 7 million items including over 2 million volumes and more than 28,000 serial publications (scientific, scholarly, and specialized journals and periodicals); regional and national newspapers; foreign, federal, state, and municipal documents; United Nations publications; and other materials in a variety of print, electronic, multimedia, and micro formats.

The Libraries' online catalog, Griffin, provides access to information on books, journals, documents, media materials, and select electronic resources. Summit, a joint catalog that WSU shares with 33 academic libraries in Washington and Oregon, and provides an online requesting service for book delivery at participating campuses.

The Libraries provide Web access to a wide variety of electronic indexes and abstracts, as well as thousands of full-text electronic journals and books. Librarians provide personal assistance and online and email reference to users of these traditional and electronic collections, and provide access to materials from other libraries.

Holland/Terrell Library, the largest of six Pullman-campus libraries, provides extensive collections in the social sciences, business, fine arts, and the humanities, as well as sophisticated service components designed to assist students, faculty, and researchers. Manuscripts, Archives, and Special Collections contain rich collections of primary source materials including books, manuscripts, maps, photographs, and digital collections to support study and research in a number of fields, including Pacific Northwest history, modern British literature, regional publishing, veterinary history, agricultural history, wildlife and outdoor recreation, WSU history, and other subjects. Media Materials & Reserves houses equipment and provides CDs, DVDs, videotapes, films, slides, audio tapes and other media for classroom instruction and for personal checkout, as well as housing course Reserves. Special media collections include the WSU-UI Regional Media Collection, the McCaw Classic Feature Films, Gnaedinger Historical Films, Pitzer Classic Radio Tapes, and others.

The Owen Science and Engineering Library supports study and research in the pure and applied sciences with substantial traditional and electronic collections in these disciplines. The Owen Library's wireless Commons has Microsoft Office workstations, fast Internet connections, hotwired carrels, a reference/info center, and collaborative learning areas.

The collections of the George W. Fischer Agricultural Science Library, located in Wegner Hall, primarily support the instructional and research needs of the College of Veterinary Medicine and the College of Pharmacy.

The George B. Brian Education Library in Cleveland Hall offers a wide range of materials and services to meet research and instructional needs from preschool through higher education and adult education.

The Architecture Library, which supports programs in the School of Architecture, is located in Carpenter Hall. In addition, library facilities and services are available at the Spokane, Tri-Cities, and Vancouver regional campuses, and at the intercollegiate college of Nursing (Spokane) and the WSU Energy Library (Olympia). Library services for students enrolled in the Distance Degree Program or other distance learning programs are available via toll-free telephone, email, and/or web-based services. The WSU Libraries are open throughout the year, although hours vary during intersessions and holidays. Visit www.wsulibs.wsu.edu for detailed information on library resources, services and hours.

Computing Services/Information Technology
infotech.wsu.edu

Student Computing Services--For information about services please call 335-6240.
Academic Computing Facility (ACF) For additional information, contact the Computing Information Center (335-0411). Various handouts are available free of charge; certain other manuals and publications are sold at the Personal Computing Center. Training courses, both free and fee-based, are available.

Museums and Collections

College of Agricultural, Human, and Natural Resources

The Minnie Barstow Drucker Memorial Collection of Oriental art is maintained by the Department of Apparel, Merchandising, Design, and Textiles. The Drucker Collection consists of Oriental furniture, accessories, art, textiles, and costumes. The collection was given to the University in 1944 by the late Arthur Eilert Drucker in memory of his wife. The Chinese, Korean, and Japanese artifacts were collected during the years the Druckers made the Orient their home. The collection is in storage in the Holland Library. For more information contact the Department of Apparel, Merchandising, Design, and Textiles at 335-3823.

The Historic Textiles and Costume Collection contains approximately 4,000 items of women's, children's, and men's clothing and costume accessories from 1935 to the present, and quilts and woven coverlets. It also contains a limited number of ethnic textiles and costumes from around the world. The collection is

housed in Kruegel Hall. Contact the Department of Apparel, Merchandising, Design, and Textiles at 335-3823.

One of the largest insect collections in the Pacific Northwest, the Maurice T. James Entomological Collection houses over one and a half million insect specimens and an extensive working library. Adults and immature stages of all insect groups and many related arthropods are represented with particular strengths in the flies, beetles, and butterflies. Primarily of regional significance, the collection also includes considerable material for the New World topics, eastern North America, and Europe. The collection functions essentially as a research facility by providing specimens on loan to recognized scientists worldwide, by offering identification services to University extension entomologists, and by serving as a repository of type specimens and other materials. The collection room is located in the Food Science and Human Nutrition building, Room 157. Contact Dr. Richard Zack at 335-3394 to arrange a tour and presentation.

The Mycological Herbarium was founded by Frederick D. Heald, the first chair of the Department of Plant Pathology, in 1915. It now contains more than 70,000 specimens of fungi, including representative materials of all the major groups from the slime molds and true molds to the larger, fleshy mushrooms. The parasitic fungi of northwestern North America have been emphasized; however, through exchange and purchase, representative materials of all groups from all over the world have been incorporated. Loans are freely available to individuals associated with recognized botanical institutions anywhere in the world. The Herbarium is maintained by the Department of Plant Pathology and is located on the third floor of Johnson Hall. Specialists wishing to utilize the facilities are welcome and are asked only to inform the Department of Plant Pathology, 335-9541, in advance.

The Henry W. Smith Soil Monolith Collection contains more than 150 preserved soil profiles, some as much as eight feet in length, representing soils from all of the geographic regions in the State of Washington and nine of the eleven soil Orders in Soil Taxonomy. Soils that are particularly well represented in the collection are those of the Palouse region and those from eastern and central Washington that contain layers of volcanic ash from the many prehistoric and historic eruptions of volcanoes in the Cascade Region. The collection is the work of Dr. Henry W. Smith, Emeritus Professor of Soils at Washington State University. The soil monoliths constitute a very valuable resource for both teaching and research within the Department of Crop and Soil Sciences. The collection is located in Johnson Hall 114, and may be viewed from an observation window any time the building is open. Persons interested in touring the collection should contact Dr. Alan Busacca at 335-1859.

College of Liberal Arts

Permanent exhibits at the Museum of Anthropology illustrate topics in human biological and cultural evolution and the culture of the native people of the Columbian Plateau. The museum houses archaeological collections from the interior Northwest that represent a record of the last 11,000 years of human occupation. This is the most extensive collection of archaeological materials from the Columbian Plateau, and it forms an important research resource for those interested in this region's archaeological history. Research collections representing faculty archaeological research in the Southwestern U.S. are also maintained. In addition, there are important collections of historic period Native American basketry from several parts of western North America. The museum staff includes Dr. Mary Collins, Director.

College of Sciences

The Charles R. Conner Museum, located in Abelson Hall, exhibits fish, amphibians, reptiles, and several hundred mounted birds and mammals, including deer, antelope, mountain sheep, mountain goat, cougar, and small species. The display collection is open to the public from 8:00AM-5:00PM weekdays.

The Culver Display, located in Webster, houses the Jacklin Petrified Wood Collection. This spectacular collection contains more than 2,000 cut and polished specimens of petrified wood from all major localities in the western United States. It is the largest display of its kind in the western United States. Also included in the Collection is a large selection of cut and polished agate, geodes, and dinosaur bone. The Culver Collection includes over 100 classic rock and mineral specimens from localities throughout the world. Both the Jacklin and Culver Collections may be viewed weekdays, 8:00AM-5:00PM. Tours may be arranged by calling the Department of Geology, 335-3009.

The Marion Ownbey Herbarium is an internationally recognized resource for research, teaching, and service. The Herbarium houses 300,000 plant specimens, primarily from the Pacific Northwest, but including worldwide collections. In addition to native vascular plants and weeds, the Herbarium contains mosses, liverworts, lichens, and special collections of seeds and cultivated plants. The Herbarium is located in Heald G-9 and is open weekdays from 8:00AM-5:00PM and by appointment 335-3250.

College of Veterinary Medicine

The Worthman Veterinary Anatomy Teaching Museum features several hundred specimens of mammals and several exhibits of fowl. The collection consists primarily of domesticated animals, since they represent the species most important to veterinary medical education and research, yet a few wild species are included also. The only one of its kind in the nation, the Museum offers a unique learning environment. It is used extensively for teaching purposes in classes of anatomy, radiology, and surgery, and it serves as a reference tool for current research by veterinary medicine faculty members. The Museum is located on the second floor of Wegner Hall. For information, call 335-6621.

Museum of Art

The Museum of Art was established in 1974 around a core collection of American paintings assembled by former President E.O. Holland and former WSU Regent Charles Orton. Dedicated to serving the educational purposes of WSU and the people of the State of Washington, the Museum operates a program which embraces a wide variety of changing exhibitions ranging from antiquity to the contemporary, from design and photography to sculpture and painting, by internationally, nationally, and regionally known artists. Many of the exhibits originated by the Museum staff have toured the nation. The Museum offers a wide variety of speakers, films, and special programs throughout the year.

The Museum's collection of American 19th and 20th century painting, drawing, and prints has grown in the past years through financial donations and important gifts from collectors and alumni in the Northwest. In 1975, the Museum of Art was a founding member of the Washington Art Consortium, a cooperative venture by four small museums to build a major national collection of works on paper by American artists. The Museum's consortium activities have provided an added focus to its own collecting of works on paper. The Museum's programs are free and open to the public. For more information, call 335-1910.

Research Support Facilities

The Office of the Campus Veterinarian (Laboratory Animal Resource Center) is the central coordinating facility for the care, production, procurement, and use of laboratory animals at WSU. It provides assurance to governmental agencies, granting authorities, accrediting bodies, and the public that all animals utilized by WSU in teaching, research, and testing are cared for in a humane manner consistent with established federal and state guidelines. The Office also provides formal presentations, informal assistance, and educational services to assist instructors and investigators in their use of animals.

The Center for Integrated Biotechnology (CIB) is an organized research unit that operates as an interdepartmental, inter-college and multi-disciplinary program across campus. The Center has broadly defined biotechnology as the use of living organisms or their products to modify human health and the human environment. The applications of biotechnology are extensive and have already had critical impacts in agriculture, human health, and environmental protection. The Center for Integrated Biotechnology promotes multi-investigator research programs and the development of new and innovative advanced technologies. The CIB is designed to enhance and increase the level of basic and applied research being done in the area of biotechnology at WSU. In addition, the CIB promotes interactions with the biotechnology industry through spin-out companies and technology transfer. University research plays a critical role in the biotechnology industry and the Center's role is to facilitate this process. Additionally the Center operates Core Laboratories that provide high-tech centralized services to members in areas such as bioinformatics, genomics and proteomics. These cores enhance faculty research capabilities and improve opportunities to compete for federal and industry research grants and contracts. The Center has integrated activities that include seminars, workshops, and retreats to promote interactions with members across campus. The Center facilitates the development of campus-wide undergraduate and graduate education programs involving the biotechnology area. The Center currently has approximately 161 research faculty and is expanding rapidly. For more information go to: http://www.biotechnology.wsu.edu/

WSU's Office of Grant and Research Development (OGRD) was established with the mission of assisting the university's faculty and graduate students in securing extramural support for their scholarly, research, teaching, and community service activities. OGRD promotes and facilitates the procurement of grant and contract funding through information dissemination and outreach, proposal and award processing. OGRD offers education and training for proposal development and writing classes throughout the year. For more information please visit OGRD's website at: www.ogrd.wsu.edu.

Washington State University's Office of Intellectual Property Administration is the campus resource for patents and technology transfer. In this office, faculty inventions are managed and transferred into the public domain. In addition, applying for patent protection protects the rights of WSU and the inventors.

The Nuclear Radiation Center serves as an all-University resource unit, supporting research and graduate education related to nuclear engineering and physics, radiochemistry, elemental analysis, and neutron activation analysis.

The Radiation Safety Office administers a program providing for the safe use of radiation machines and radioactive materials in research, service, and instruction at the main campus, regional campuses, and at the extension centers. The activities of this program are conducted in accordance with the statutes and rules of radiation protection specified in WAC-246, and with the conditions enumerated in Radioactive Materials License WN-C003-1 issued by the State of Washington.

The Office of Research Assurances provides oversight and coordinates compliance efforts (as required by federal and state laws and University policies) primarily through close cooperation and coordination with the following faculty/Presidential Committees:

1. Institutional Animal Care and Use Committee (IACUC)
2. Institutional Biosafety Committee (IBC)
3. Institutional Review Board (IRB)
4. Radiation Safety Committee (RSC)

The Research Compliance Office offers support and help to researchers to identify, understand, and comply with all pertinent regulations, rules, and policies. The Office is a resource for facilitating the conduct of research at WSU.

The mission of the Social and Economic Sciences Research Center is to strengthen research in the social, economic, and behavioral sciences at Washington State University. This mission is pursued through a variety of activities including a computer-assisted telephone interview facility, mail survey capabilities, personal interviewing capabilities, assistance to faculty in the preparation and submission of research proposals for extramural funding, and efforts to stimulate and organize interdisciplinary research. Consultation is also provided to faculty, staff, students, and others on the development and implementation of research projects.

Although located at Washington State University, the Water Research Center is a cooperative venture by WSU and the University of Washington with input from other state research universities. The mission of the Center is to plan, promote, conduct, and administer research in water resources; to educate and train scientists and engineers through participation in research projects; and to disseminate the results of completed research to users through publications, conferences, seminars, short courses, and symposia. The Center operates in consultation with state, federal and private water-interested organizations.

Statistical Services is a statistical consulting service provided by the Department of Statistics for WSU faculty, staff, and student researchers. Assistance is provided in the design of experiments and sample surveys, analysis of data including use of statistical packages, and interpretation of results of statistical analysis.

College of Agricultural, Human, and Natural Resource Sciences

The College of Agricultural, Human, and Natural Resource Sciences (CAHNRS) houses many departments, units and centers whose missions involve research. The Agricultural Research Center (ARC) is the administrative unit within CAHNRS overseeing research performed within the College. Research is conducted within the following departments: Agricultural and Natural Resource Sciences; Animal Sciences; Apparel, Merchandising, Design and Textiles; Biological Systems Engineering; Crop and Soil Sciences; Entomology; Food Science and Human Nutrition; Horticulture and Landscape Architecture; Human Development; Interior Design; Plant Pathology; Natural Resource Sciences; Rural Sociology; and Statistics. The Institute of Biological Chemistry performs fundamental research in the biochemistry and molecular biology of plants. CAHNRS also houses several centers, which are collaborative programs for conducting unique interdisciplinary types of research. These include: the Center for Precision Agriculture Systems, the Center for Nonthermal Processing of Food, the International Marketing Program for Agricultural Commodities and Trade (IMPACT) Center, and the Center for Sustaining Agriculture and Natural Resources. Lastly, there are collaborative and interdisciplinary research projects involving other colleges and regional campuses within the University including: the College of Engineering and Architecture (Wood Materials and Engineering Laboratory); the College of Sciences (School of Molecular Biosciences, the Center for Reproductive Biology, and the Program in Environmental Science and Regional Planning), the College of Veterinary Medicine (Field Disease Investigative Unit), the Interdisciplinary Design Institute (WSU Spokane) and the State of Washington Water Research Center.

The research programs in CAHNRS are diverse and require many sites that carry out the work, especially plant-related sciences. Regional locations having extensive laboratory and field-research equipment include the WSU Prosser Irrigated Agriculture Research and Extension Center; the WSU Tri-Cities campus Food and Environmental Quality Laboratory; the WSU Wenatchee Tree Fruit Research and Extension Center; and the WSU Puyallup Research and Extension Center. Other research and extension units include the Lind Dryland Research Unit, the WSU Vancouver Research and Extension Unit, the Long Beach Research and Extension Unit and the Mount Vernon Research and Extension Unit. The Food and Environmental Quality Laboratory has state of the art equipment to detect environmental contaminants. FEQL laboratory faculty ensures the quality of safety of food, the long-term sustainability of our food-processing lands and surrounding environment, and economic viability of the agricultural and food industries of the region. Many WSU scientists are located throughout the state to solve problems associated with production and marketing of Washington's agricultural and forestry products and to provide basic knowledge for improving the efficiency, quality, and quantity of production needed to supply an ever-increasing demand for food, fiber, and improvement in the quality of life.

The International Marketing Program for Agricultural Commodities and Trade (IMPACT) Center funds interdisciplinary research, extension, and teaching to assist the state in exporting its agricultural products. Its major thrusts are in uncovering marketing opportunities, developing strategies to exploit those opportunities, solving economic and technical impediments to current agricultural exports, and finding alternative products or processes with export market potential.

The Center for Nonthermal Processing of Food includes faculty members from Biological Systems Engineering, Food Science and Human Nutrition, Electrical Engineering, Biochemistry/Biophysics, and Microbiology. Research at the Center is focused on pulsed electric fields, oscillating magnetic fields, and high hydrostatic pressure as alternatives to more widely used methods of food processing that involve application of heat. These new technologies produce minimally processed, fresh-like, safe food products to meet consumer demand for high quality processed foods without degradation, which often accompanies thermal processing methods.

The Center for Precision Agricultural Systems fosters collaborative research, education, and outreach programs that produce practical technologies and management system for precision agriculture. The Center brings university expertise from agriculture, engineering, computer science, and other units across the state in external collaborations to address critical issues preventing economic implementation of information-based agriculture. Technologies include sensors for monitoring plant and environment status, software for data analysis and modeling, decision models for system optimization, and equipment to implement precision management decisions. These technologies and related educational offerings support competitive production of agricultural commodities, while stimulating economic development and protecting the environment and natural resources.

The Center for Sustaining Agriculture and Natural Resources (CSANR) works to create sustainable agriculture and natural resource systems providing a high quality of life for the people of Washington. The CSANR leads in developing and implementing interdisciplinary systems-oriented research and education programs at WSU. CSANR facilitates work towards sustainable agricultural systems, provides information through educational activities and publications encourages the use of sustainable agriculture practices including improving air, water, and soil quality, and attempts to strengthen rural communities by providing farming opportunities for future generations. It sponsors capacity building programs in areas of consensus building and conflict.

The majority of the coursework undertaken by graduate students in CAHNRS is centralized on the Pullman campus. On the Pullman campus most CAHNRS faculty hold joint appointments in teaching and research. In addition, many of the research scientists at the other research centers around the state serve in varying degrees in the academic guidance of graduate students in CAHNRS and in the direction of thesis work. The association of graduate students with the Agricultural Research Center research programs, scientists, equipment and facilities offer a depth of experience and training beyond that ordinarily encountered.

College of Business

The statewide office of the Small Business Development Center, located at WSU Spokane, provides training programs, research services, and management counseling to business firms and communities throughout Washington. To this end, the Center draws on its own professional staff as well as on the resources of the University and other cooperating Washington institutions of higher education. The Center's

Business Development Specialists provide no-fee, confidential, one-on-one counseling on all management topics. The counselors have certified broad-based skills and significant experience as business owners or managers. They help improve profitability and growth with assistance in buying, selling or starting a business, preparing a business plan, choosing and incorporating new technology, analyzing finances, and improving marketing.

Business counseling is also available through NetCounseling. This innovative program permits live, fact-to-face business counseling and technical assistance over the Internet from a designated NetCounseling site or a business owner's office or home PC. In addition to business counseling, the SBDC evaluates new products through its Innovation Assessment Center on a fee basis.

The SBDC provides business training through many Washington community colleges. They offer seminars, workshops, and conferences to assist small business owners and operators with specific skills and methods to maintain or expand their business.

College of Engineering and Architecture

The Center for Materials Research is an interdisciplinary effort involving faculty from physics, chemistry, mechanical, and materials engineering. It involves more than 20 researchers and attracts significant funding for equipment and research in such projects as deformation and fracture, diamond and thin films, soft lithography, semiconductors, electron tunneling microscopy, and nondestructive probes (e.g. positron beams) of defects in solids at the atomic and nuclear levels. Visit www.cmr.wsu.edu to learn more.

The Center for Multiphase Environmental Research unites doctoral students from a variety of departments to address threats to the water, air, and earth. Students in this program work in teams to transfer their own innovations to industry for application and commercialization.

The Wood Materials and Engineering Laboratory (WMEL) is an interdisciplinary research facility involving faculty and students from engineering and materials science. It attracts significant funding for research on natural fiber composite development, materials science. It attracts significant funding for research on natural fiber composites development of natural fiber composites (e.g. wood-plastics and I-joists), nondestructive evaluation techniques, and novel building design and construction techniques. For more information visit: www.wmel.wsu.edu.

The Center for the Design of Analog-Digital Integrated Circuits is an NSF-sponsored industry-university research consortium in integrated circuitry that addresses electronics industry problems in the fast growing field of mixed signal design. Emphasis is on research in low-voltage circuits, wireless communication, and design for high-performance data converters and associated simulation, modeling, and layout tools. It has garnered more than 24 industrial and four university partners and has involved more than 210 students since it began in 1990. www.cdadic.com

The Power Systems Engineering Research Center (PSerc) is a multi-university collaborative research center supported by the National Science Foundation and the Electrical Power Research Institute. PSerc supports research on the practical problems and those particularly associated with a restructured deregulated power industry. WSU was invited to join PSerc because of its strong power engineering program.

The Center for Nonthermal Processing of Food investigates preservation of food by high-voltage pulsed electric field, microwaves, ultra-high pressure, oscillating magnetic fields, and combines methods. It draws both extramural corporate and government support. Novel food preservation and packaging techniques are developed for the U.S. military.

The Albrook Hydraulic Laboratory provides engineering services to government and industry in hydraulics and water resources. For more than four decades, it has helped solve hydroelectric power problems, salmon fish recovery efforts, facilities construction, flood mitigation, land-based hazardous waste management, hydrology, and engineered wetlands. www.ce.wsu.edu/Hydraulics/hwOverview.htm

The Laboratory for Atmospheric Research is recognized worldwide for its pioneering role in the development of regional and national emission inventories, tracer methods to measure air and ground gas pollution of all kinds, worldwide methane emissions surveys, windblown dust, and photochemical air contamination in the Northwest. Recent investigations include Spokane and Puget Sound health hazard research on small air particulates, ozone concentration in the Puget Sound region, and improved understanding of global warming by measuring biogenic hydrocarbons released from vegetation. Visit lar.wsu.edu for more information

The centers for Virtual Reality in Design and Manufacturing and Advanced Multiphase Materials Processing work with industry on practical problems in superplastic forming, rapid prototyping, mass transfer, geometric modeling, and other related areas.

College of Liberal Arts

AccessNorthwest strives to increase access to and use of government information, particularly by disenfranchised populations. The group hopes to enhance civic engagement and to build a more informed electorate for a stronger democracy.

The Center for Communication and Decision Making, led by Dr. Erica Austin and Dr. Bruce Pinkleton, studies scientific-based development and scientific evaluation of media literacy interventions, especially as they apply to health campaigns. Dr. Moon Lee also evaluates technology such as hypertext and the choices it provides, and she analyzes how people use that technology.

The Digital Recording Studio was established in 2003 to serve the programmatic needs of the Music Program within the School of Music and Theater Arts. Located in Kimbrough Music Building, the studio provides an ideal acoustic setting for limited scope recordings in the studio, and processing of on-location recordings from other venues. The recording studio is equipped with a Fazioli Concert Grand Piano and the most current versions of the requisite digital recording, editing, and processing equipment.

The Hearing and Speech Clinic, located in the Health Sciences Building on the WSU Spokane campus, is operated jointly by the WSU Department of Speech and Hearing Sciences and the Eastern Washington University Communications Disorders Department. The Hearing and Speech Clinic is a state-of-the-art facility that serves the Department of Speech and Hearing Sciences' tripartite missions in teaching, research and service. The Clinic provides a full range of assessment and rehabilitation services to the community in the

areas of speech, voice, language, and hearing. Graduate students gain valuable clinical experiences with patients across the lifespan under supervision of nationally certified and state licensed faculty. Clinic clientele are invited to participate in master's thesis research approved by the WSU and EWU Institutional Research Boards (IRB).

The Humanities Research Center was established in 1980 by the Dean of the Humanities and Social Sciences Division (now College of Liberal Arts) to provide shared facilities, equipment, and consulting services in support of humanistic research by the faculty of the College. The facilities and services of the Center are available to all faculty in the College subject to a schedule of project priorities and, since 1984, computing support has been provided to all graduate students in the College. This support is predominantly in the area of text processing (production of books, articles, and dissertations) and photocomposition of scholarly journals, as well as new visual media communications.

The Laboratory for the Study of Communication Emotion and Cognition investigates how media message characteristics affect cognitive and emotional responses to messages.

The Language Learning Resource Center (LLRC) was established in 1912 by the Department of Foreign Languages and Literatures as a teaching resource center. Since its inception the Center has been a focal point within the Department for exploring the use of technology in the teaching of languages. Today, the LLRC is engaged in managing and maintaining two computer-based language learning labs offering undergraduate and graduate students access to course specific on-line language learning tools and resources. Additionally, the Center manages and maintains a Departmental web server and a streaming audio/video server that together provides students with 24-hour access to a wealth of language related educational and informational resources. Of course the LLRC also maintains equipment (such as audio and video tape players) for accessing its extensive collection of traditional audio and video resources. Overall, the LLRC is both an established language learning service center for the Department and at the same time a research tool for faculty interested in exploring new teaching techniques and technologies and building new language learning tools and resources.

The Department of Psychology has recently developed an Undergraduate Human Psychophysiology Laboratory. This laboratory combines the standard E-prime computer software for testing of cognition and behavior along with equipment for the examination of central nervous system activity responsible for cognition and behavior. The laboratory provides state of the art technology for measurement of brain activity by means of electroencephalograph (EEG). Also included are devices for peripheral physiological measurement of skin conductance response (SCR) and cardiovascular activity. The laboratory is designed to be used by Undergraduates with minimal technical training, but is also available for use by graduate students.

The Sociological Data Processing Center and the Social Science Computing Laboratory are important resources for graduate students in the sociology program. Supported by the College of Liberal Arts, they are located adjacently in Wilson Hall 231 and 233. They serve many functions, including provision of the following: Internet access and email, access to the campus UNIX system, data manipulation and analysis programs, graphics and image processing software and consultation services for statistical techniques and procedures. While the Sociological Data Processing Center is reserved exclusively for graduate students and faculty, the Social science Computing Laboratory is used primarily for graduate students and faculty course instruction in the College of Liberal Arts. In all, there are 28 Gateway 2000 Pentium computers with large 17-inch displays for student use. High-speed laser printers, scanners, and mass storage devices ensure that graduate students have access to quality computing resources. In recent years, computer labs for graduate students have been installed in Anthropology and Political Science. Another lab in Fine Arts was also expanded.

The Writing Center, established in 1983 by the Department of English, is an instructional resource center serving students and faculty who want assistance with writing. The Center offers several courses, an on-line writing component, and is a consulting resource for instructors who want assistance in incorporating writing into their courses.

The Thomas S. Foley Institute for Public Policy and Public Service, established in 1995 by the College of Liberal Arts, supports congressional and legislative studies, public policy research, voter education, and community outreach. The Institute will also provide opportunities for public service internships in Congress, state legislatures, and other governmental and non-profit organizations.

The Division of Governmental Studies and Services employs graduate students on research projects relating to government and public affairs, administers an internship program to provide practical experience in government, and maintains a collection of specialized government publications.

College of Sciences

The Franceschi Microscopy and Imaging Center, located in Science Hall, is available for training and research in science and technology. Washington State University students, staff, and faculty members have access to the facilities for training consultation, and service work under flexible conditions designed to provide maximal use of the EMC. Formal courses in electron microscopy are offered by the Center. The EMC maintains three transmission electron microscopes (including an analytical TEM equipped with STEM and EDX), a scanning electron microscope, also with EDX, a new confocal microscope, and a full complement of ancillary equipment and facilities. The Center has a skilled staff experienced in handling a wide range of research problems in electron microscopy.

The Environmental Research Center is closely integrated with the academic Program in Environmental Science and Regional Planning and is the focal point for university development of interdisciplinary research on problems related to the environment.

The James Richard Jewett Observatory is the gift of Mr. and Mrs. George F. Jewett of Spokane and is named in honor of Mr. Jewett's father, a former professor of ancient languages at Harvard University. The Observatory houses a twelve-inch refractor with a visual lens and a twenty-five foot revolving dome. The University Planetarium is located in Sloan Hall 231. Information about open house and group tours of either the Observatory or Planetarium can be obtained by contacting the Program in Astronomy.

The Center for Nuclear Magnetic Resonance (NMR) is in the Chemistry Synthesis Building. The Center houses three high-field superconducting NMR instruments. Additional instruments will be added within five years. The prime purpose of the instruments is to characterize structures of biological samples as

solids or in solution for faculty and students in the sciences, agriculture, veterinary medicine, and pharmacy.

The Institute for Shock Physics was created in 1997 from the Shock Dynamics Center and given a broader mission. The Institute is involved in shock wave research that promotes the understanding of physical and chemical changes in solids and liquids under very rapid and large compressions, and applying this knowledge to fundamental and applied problems of strategic national interest. Scientific activities at the Institute examine physical and chemical changes at extreme conditions through: time-resolved, optical spectroscopy and x-ray diffraction to probe atomic/molecular processes in shock wave experiments; time-resolved, continuum measurements in shock wave experiments; static high pressure measurements using diamond-anvil-cell experiments; and theoretical developments and computational modeling to stimulate dynamic compression phenomena at different length scales. The Institute's Applied Sciences Laboratory, a multidisciplinary contract research organization, undertakes a broad range of applied research activities of interest to industry and government agencies; it is located at WSU Spokane.

The Laboratory of Bioanalysis and Biotechnology (LBB) has three units with closely related but distinct functions. LBB I provides protein and DNA sequencing as well as peptide and oligonucleotide synthesis. It also has gene chip analyzers for genomics research. LBB II houses four mass spectrometers to do proteeomics and high resolution analysis of biological macromolecules. LBB III provides amino acid analysis of peptides and other biological material.

To assist the University in attracting and conducting research materials-related areas and to strengthen the educational capabilities of the University, the Center for Materials Research was established as an interdisciplinary unit to serve the scientific community. The Center promotes interaction between researchers, provides mechanisms to improve educational programs in materials science, and provides a focal point for the purchase and construction of shared equipment and the development of other resources. It is shared between the Colleges of Science and Engineering and Architecture.

The Center for Reproductive Biology was formed in 1996 and is now comprised of 77 faculty investigators at WSU, the University of Idaho, and National Marine Fisheries. The broadest definition possible is used for reproductive biology and research associated with the Center. In mammals any process involved or related to reproduction including neuroendocrine control, gonadal function, gamete biology, fertilization, implantation, pregnancy, reproductive tract biology, reproductive disease (e.g. breast cancer) and fertility. In addition, reproduction in non-mammalian species and plants is considered. The current faculty has areas of interest from domestic animal and human reproduction to fish and plant reproduction. This diversity in research areas is a major strength of the Center and fosters collaborations not previously considered. The objectives of the Center are to foster research of the highest quality and promote collaborative interactions among Center members; enhance opportunities for extramural funding with an emphasis on multi-investigator grants; and to enhance the training and education programs of advanced undergraduate, graduate and postdoctoral fellows with an interest in the biology of reproduction. Additionally, the Center operates 11 Core Laboratories that provide high-tech centralized services to members. These cores enhance faculty research capabilities and improve opportunities to compete for federal and industry research grants and contracts. For more information on the Center, please visit: http://crb.wsu.edu/

College of Veterinary Medicine

Since its creation in 1974, the Washington Animal Disease Diagnostic Laboratory (WADDL) has provided essential laboratory services in bacteriology, parasitology, pathology, serology, toxicology, and virology. The Laboratory is an integral part of a network of tax-supported state diagnostic reference facilities throughout the United States dedicated to the betterment of animal and human health. WADDL has a responsibility to provide appropriate, timely results to safeguard the health of livestock, pets, poultry, and fish in the Pacific Northwest and to protect the public from zoonotic diseases. Advice and consultation is provided to practicing veterinarians, animal industry groups, state and federal regulatory officials, and physicians. WADDL also provides centralized service for the College by providing electron microscopy and histology support.

The Animal Health Research Center (AHRC) provides oversight of research programs within the College of Veterinary Medicine, with an emphasis on diseases of agricultural animals and public health. Center research is divided into core programs that include transmissible spongiform encephalopathies, food borne diseases and antimicrobial resistance, immunology and vaccine development, microbial and host genomics, vector-borne diseases, and lentiviral disease. In conjunction with the College departmental graduate programs, AHRC research programs provide undergraduate research and graduate education opportunities.

Institute of Biological Chemistry

The Institute of Biological Chemistry is dedicated to research on fundamental aspects of biological chemistry relevant to agriculture and forestry. Although not offering a formal course of study leading to a degree, the Institute provides research opportunities to fulfill the requirements for the Master of Science and Doctor of Philosophy in the graduate programs in the School of Molecular Biosciences (biochemistry/biophysics, chemistry, genetics, and cell biology), and the Graduate Program in Molecular Plant Sciences.

Research fellowships and assistantships are available in the Institute for incoming students on a competitive basis. Teaching assistantships are available from cooperating instructional departments and programs through which entry to the Graduate School is obtained. The most important component of any doctorate program involves independent study and original research in the area of the student's interest. The internationally recognized research programs of the Institute cover a broad spectrum of areas from plant biochemistry, molecular biology, and genetic engineering to plant pathology and pest resistance, as well as the traditional areas of biochemistry. These programs receive support from federal, state, and private sources. The Institute thus offers a unique opportunity for graduate training in an intensive research environment which complements formal study leading to the chosen degree. All recent graduates are in positions appropriate to their training in academic, industrial and governmental institutions.

The Institute is housed in modern, well-equipped laboratories, and enjoys the support of centralized campus research facilities. Broad-based support of the Institute through the cooperative efforts of several colleges within the University assures a solid foundation for a wide scope of research activities, and provides for strong interaction of the Institute faculty with other scientists. The Institute also cooperates with agricultural,

academic and industrial organizations at the regional, national, and international levels. An active seminar and visiting scientists program further contributes to the focused research environment.

Cancer Prevention and Research Center

The interdisciplinary Cancer Prevention and Research Center functions as the focal point of cancer prevention research at Washington State University. While serving to catalyze and coordinate collaborative efforts around the University, the Center also provides central support services and shared facilities for on-going research.

Center for the Study of Animal Wellbeing

The Center for the Study of Animal Wellbeing is a joint development between the College of Veterinary Medicine and the Department of Animal Sciences in the College of Agricultural, Human, and Natural Resources. The primary mission of the Center is to generate and disseminate new knowledge to make animal well-being and human-animal interactions better understood. Research areas include indicators of animal well-being, objective assessment of stress and pain, animal behavior and preferences, and the interrelationship of animal health and well-being to production and performance.

Center for Teaching, Learning, and Technology

The Center for Teaching, Learning, and Technology is a central resource for all WSU instructors, including graduate teaching assistants. The CTLT works with faculty to identify and implement strategic methods of incorporating successful teaching approaches into their courses and programs. In addition, the CTLT applies current scholarship on effective teaching and learning to develop a variety of resources to help instructors in their efforts. The CTLT's resources include consultations about course and learning activity design, assessment techniques, and integrating instructional technologies; frequent discussions and workshops; and on-line technologies for learning and assessment. CTLT is located in ITB 2001B and can be reached at 335-1355 or ctlt@wsu.edu.

Center for Distance and Professional Education

The Center for Distance and Professional Education (CDPE) is responsible for extending the educational resources of the University to people throughout the State of Washington, and beyond. Distance Degree Programs (DDP), a unit of CDPE, collaborates with University departments and administrative units to provide online distance degree programs at the graduate and undergraduate levels. DDP also provides a mechanism for academic departments to deliver select courses to various sites in the State of Washington and other areas. Professional Education (PE) provides professional training programs and conferencing support services for large and small programs, and DDP and PE cooperate to offer both credit and noncredit on-line certificate programs. CDPE provides services such as marketing and market research, instructional design and development, and student and faculty support for each of the activities it delivers.

Graduate Programs at Regional Campuses

With the creation of WSU's multi-campus system in July 1989, select graduate programs are offered at the University's regional campuses in Spokane, Tri-Cities, and Vancouver. Expansion of offerings will continue as the campuses grow. Graduate students who plan to use coursework and research undertaken through the regional campuses must be admitted to the Graduate School on the Pullman campus. Requirements are generally the same.

WSU Spokane

WSU Spokane offers master's degrees in architecture, criminal justice, engineering management, exercise science, health policy and administration, interior design, landscape architecture, and speech and hearing services. Supporting courses toward the Master in Teaching, Doctor of Education, and administrative credentials (certification for principals and superintendents) are also offered. The Doctor of Design is an interdisciplinary degree for persons who are well versed and professionally skilled in the design profession and who seek to make substantive, innovative, and original scholarly contributions to their fields. Courses taken at WSU Spokane may apply to the PhD in Criminal Justice, the Individual Interdisciplinary PhD, and other doctoral degrees, depending on the program. The Doctor of Pharmacy program established in 1992 begins studies at WSU Pullman and finishes at WSU Spokane.

The campus also offers a Graduate Certificate in Exercise Science and a post-master's School Psychology Certification (one of only 3 in the nation). The campus also houses upper-division baccalaureate studies in a number of disciplines: architecture; construction management; exercise physiology and metabolism; interior design; landscape architecture; and professional development studies with programs in informatics and other areas under development. Students begin undergraduate studies at WSU Pullman, community college, or another accredited higher education institution, and complete at WSU Spokane.

New classrooms, research laboratories, and computer labs are located at the Riverpoint campus, in the heart of a developing university district. Students benefit from the metropolitan context and urban amenities. The full range of academic and student services is available, including the Cooperative Academic Library Service (CALS) shared by students of WSU Spokane and Eastern Washington University. WSU Spokane also has exclusive research and public service programs in the health sciences, design disciplines, and policy, social, and behavioral sciences that leverage the strength of a top public research university with access to community resources for collaborative research and internship opportunities for students. For specific information, contact WSU Spokane:

Student Services
Health Sciences Building 125E
310 N. Riverpoint
PO Box 1495
Spokane, WA 99202-1495
enroll@wsu.edu

509-358-7537 or visit www.spokane.wsu.edu

WSU Tri-Cities

WSU has offered credit courses in the Tri-Cities for almost six decades. Master's degree programs currently are provided in biology, business administration, chemistry, computer science, education, electrical engineering, environmental engineering, environmental science, and mechanical engineering. Supporting coursework is available in mathematics and physics. The present facilities provide classrooms, offices, laboratories, networked computing, and an extensive library. Research is carried on in a wide variety of areas. Of particular interest here are the Food and Environmental Quality Laboratory, and the United States Transuranium and Uranium Registries, all housed at WSU Tri-Cities. Additional opportunities are available to share research laboratories and equipment of nearby US Department of Energy contractors through individual arrangements.

Graduate assistantships are available in certain departments for qualified students who wish to pursue study and research at WSU Tri-Cities. For specific information about courses, programs, facilities, or admission, contact WSU Tri-Cities:

2710 University Drive
Richland, WA 99354-1643
509-372-7250
www.tricity.wsu.edu

WSU Vancouver

WSU Vancouver has been offering undergraduate and graduate education to residents of southwest Washington and Oregon for more than 12 years. Located on a 351-acre campus in Salmon Creek, students enjoy small classes and schedules designed for place-bound students balancing their education with career and family responsibilities. Currently eight master's degrees are offered in business administration, education, engineering management, environmental science, history, nursing, public affairs, and technology management. For more information contact the WSU Vancouver Office of Admissions by phone, 360-546-9779, or email, admissions@vancouver.wsu.edu. You can also visit www.vancouver.wsu.edu for more information.

Graduate Certificate Programs

Graduate certificates are designed to provide students with an opportunity for graduate education in a specific area of study. They convey that the student has developed a mastery over course material in specific areas. While the requirements for each graduate certificate vary among departments and programs, the core is typically 9 to 12 credits of graded coursework taken at the graduate level. These core courses are generally selected to provide the student with expertise on a specific topic. In order to determine the applicability of any credits earned while a certificate student, the student must file a Program of Study as part of the admission material. The determination of applicable coursework will be made by the academic department or graduate program at the time of admission. Graduate certificates that are currently offered at Washington State University are the following:

Graduate Certificate in Agribusiness
Graduate Certificate in Bioethics
Graduate Certificate in Biotechnology Management
Graduate Certificate in Constraints Management
Graduate Certificate in Construction Project Management
Graduate Certificate in Early Childhood Leadership and Administration
Graduate Certificate in Engineering Nanotechnology
Graduate Certificate in Exercise Science
Graduate Certificate in Family Nurse Practitioner
Graduate Certificate in General Engineering Management
Graduate Certificate in Global Justice and Security Studies
Graduate Certificate in Health-Assistive Smart Environmental Design
Graduate Certificate in Interdisciplinary Environmental Biogeochemistry
Graduate Certificate in Manufacturing Leadership
Graduate Certificate in Molecular Biosciences
Graduate Certificate in Nuclear Engineering
Graduate Certificate in Nurse Educator
Graduate Certificate in Project Management
Graduate Certificate in Protein Biotechnology
Graduate Certificate in Psychiatric Mental Health Nurse Practitioner
Graduate Certificate in Reproductive Biology
Graduate Certificate in Six Sigma Quality Management
Graduate Certificate in Supply Chain Management
Graduate Certificate in Sustainable Agriculture
Graduate Certificate in Systems Engineering Management Regional Programs

Regional Programs

Program for Cooperative Courses for Graduate Students at Washington State University and the University of Idaho: Washington State University and the University of Idaho have developed a program of cooperative courses in which one institution offers exclusively a particular course for use by graduate students of both. The program provides a wider variety of graduate courses than otherwise would be possible at either University. This arrangement permits graduate students at Washington State University to take cooperative courses at the University of Idaho on the same basis that they take resident courses. No special fees are charged for these courses. In each cooperative class, the regulations of the host institution prevail; buy only

the institution in which the student is seeking an advanced degree records official enrollment and grades.

The cooperative program is limited to specific courses. All other courses taken at the University of Idaho must be presented as transfer courses, with the usual rules and fees applying. For further information, consult the chair of the department or program or the Office of the Dean of the Graduate School.

Western Regional Graduate Programs - WICHE

The Western Interstate Commission for Higher Education (WICHE) coordinates a program involving 17 graduate institutions where students who are residents of Alaska, Arizona, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming may attend Graduate School in Washington. WICHE students pay resident tuition and receive some admission preference. For more information about your program, please visit: www.wiche.edu/sep/wrgp.

Washington State University receives students in the following programs:
American Studies (MA and PhD)
Anthropology-Archaeology Option (MA and PhD)
English - Rhetoric and Composition Emphasis (MA and PhD)
Food Science (MS and PhD)
Health Policy and Administration (MHPA)
History-Public History Option (MA and PhD)
Neuroscience (MS and PhD)

Student Services and Facilities

Campus Involvement
335-9667
www.getinvolved.wsu.edu

Career Services
335-2546
Lighty 180
www.careers.wsu.edu

Campus Information
335-4636

Children's Center
335-8847
www.childrenscenter.wsu.edu

Counseling Services
335-4511
www.counsel.wsu.edu

Disability Resource Center
Washington Building 217
335-3417
www.drc.wsu.edu

Employment Office
French Ad 139
335-1969
www.hrs.wsu.edu

Equity and Diversity
335-8888
www.diversity.wsu.edu

Office of Financial Aid and Scholarships
Lighty Student Services 380
335-9711 (Financial Aid)
335-1059 (Scholarships)
www.finaid.wsu.edu

Graduate School
French Ad 324
335-6424
www.gradschool.wsu.edu

Graduate and Professional Student Association
CUB 308
335-9545
www.gpsa.wsu.edu

Benefits Services
French Ad 232
335-4589
www.wsu.edu/benefits

Bookie (Student Bookstore)
Located in the CUB
335-9444
www.wsubookie.bncollege.com

Student Legal Services
CUB 305
335-9539

Housing, Dining, and Residence Life
Streit-Perham Administration Suite
335-4577
www.livingat.wsu.edu

Center for Distance and Professional Education
Van Doren Hall 104
335-3557
www.online.wsu.edu

Office of Grant and Research Development (OGRD)
Neill Hall 423
335-9661
www.ogrd.wsu.edu

WSU Office of Veterans Affairs
French Ad 346
335-1857 or 335-1234
www.va.wsu.edu

Alternatives to Violence on the Palouse
332-4357
community.palouse.net/ATVP
Crisis Line
332-1505

Information Technology
335-HELP (4357)
infotech.wsu.edu

International Programs
Bryan Hall 108
335-2541
www.ip.wsu.edu

Legal Assistance
335-9539

Ombudsman's Office
Wilson Hall 2
335-1195
www.wsu.edu/~ombuds

Parking and Transportation
Corner of Colorado and D Street
335-PARK (7275)
www.wsu.edu/parking

Psychology Clinic
Johnson Tower 362
psychologyclinic.wsu.edu/

Speech and Hearing Clinic
335-1509
spokane.wsu.edu/academics/health_sciences/shs/shs_clinic.html

Center for Advising and Career Development
Lighty 260
335-6000
www.salc.wsu.edu

University Recreation
Student Recreation Center
335-8732
www.urec.wsu.edu

Veterans Affairs
335-1234
French Ad 346
www.va.wsu.edu

Women's Resource Center
Wilson Hall 8
335-6849
www.women.wsu.edu

Women's Transit Center
Wilson Hall 8
335-6830

Beasley Performing Arts Coliseum
Ticket Information
1-800-325-SEAT
www.beasley.wsu.edu

University Theatre Ticket Information
Daggy Hall Box Office
335-7236
www.libarts.wsu.edu/theatre/

Updated 1/11

Admission and Registration

Admission

General Information

Admission to Washington State University is granted without regard to age, sex, race, religion, color, creed, disability, national or ethnic origin, sexual orientation, or marital status. Graduates of Washington State University and other colleges and universities whose degrees are recognized by this institution and who meet the requirements for admission to the Graduate School may be admitted. Inquiries and requests for information may be found at www.gradschool.wsu.edu or you may write the Graduate School at: The Graduate School, Washington State University, Pullman, WA 99164-1030. You can also contact Graduate School Admissions at 509-335-1446.

Applicants for admission must have official transcripts from colleges or universities from which any degrees have been granted or are expected and those transcripts which show the last 60 graded semester or 90 graded quarter hours of undergraduate work taken. In addition, transcripts are required from colleges or universities showing graded graduate level coursework taken after the bachelor's degree. Official transcripts are those mailed directly to the Graduate School from the Registrar of the institution attended. Transcripts mailed by the student are not considered official. Complete credentials should be on file at least one month before registration. Transcripts from other institutions cannot be returned. Records of previous work at Washington State University need not be submitted.

The Dean of the Graduate School may approve admission of a student from a foreign university if the student presents a superior academic record, satisfactory evidence of adequate ability in English, and has sufficient financial resources. Such applications should be completed at least six months in advance of the proposed date of enrollment in the Graduate School. International students who have undertaken graduate study in other institutions will be accepted only after evaluation of their undergraduate records, as well as their performance in graduate study and the minimum criteria, as described above, will apply.

In a graduate program, a student is required to complete appropriate advanced courses, to participate in seminars, and to make an original contribution of knowledge. At least one academic year of graduate study, or the equivalent, is necessary for the completion of a program leading to a master's degree. The residence requirement for the master's degree is one academic year.

The period of study for the Doctor of Philosophy and Doctor of Education degrees is at least three years (six semesters) beyond the baccalaureate degree. For students without a master's degree, at least two of these three years shall be in residence at Washington State University (enrolled full time and present on a campus where a given program has received approval to grant residency). For students with a master's degree, at least one of these three years shall be in residence at Washington State University (enrolled full time and present on a campus where a given program has received approval to grant residency).

For the Doctor of Education, at least two of the three years beyond the baccalaureate shall be in residence at Washington State University, including a minimum of four semesters, with at least one summer session and one semester being contiguous, when the student is enrolled full time and present on the Pullman campus. Full time enrollment for four summer sessions may be substituted for two academic year semesters. Summer session cannot be substituted for the semester contiguous with a summer session requirement for the doctoral degree.

Most advanced degree programs emphasize the preparation of students for careers as productive scholars and accomplishments in research. It is recognized also that those who earn advanced degrees often become teachers in institutions of learning. For this reason, in many departments special attention is given to the preparation of students for careers in the teaching profession.

Departmental approval is required for any admission regardless of grade point average, and departments may require higher levels of performance than those cited. Because of limitations within certain departments, it may be necessary to deny admission to some qualified applicants. Graduate students are subject to the usual procedures and regulations of the institution and to such Graduate School rules and procedures as outlined in the Graduate School Policies and Procedures Manual.

Enrollment Requirements

The normal load for a graduate student is 10-18 credit hours per semester (6-8 hours in an eight-week summer session). Graduate students on half-time teaching or research assistantships are expected to carry 10-18 credits per semester with no more than 12 hours of graded credit (3-6 in an eight-week summer session). See the Graduate School Policies and Procedures Manual for requirements for graduate students on appointment or taking examinations. www.gradschool.wsu.edu/CurrentStudents/PoliciesAndProcedures/

Classification of Students

Regular Student Status

Applicants with at least a B (3.00 on a 4.00 scale) grade point average, or the equivalent in the last 60 graded semester (90 quarter) hours, from a recognized college or university; or at least a B grade point average in any graduate work from a recognized graduate school are eligible for admission to regular student status. Applicants with at least 12 semester hours of approved coursework from recognized graduate schools with at least a B grade point average are eligible for admission to regular student status.

Provisional Student Status

A student not eligible for regular student status may be admitted on provisional student status upon special recommendation of the chair of the major department and with approval of the Associate Dean of the Graduate School.

Registration

Full-time Students

Graduate students must register for a minimum of 10 credit hours to maintain full-time enrollment status in the fall and spring semesters. All full-time graduate students must register for at least one (1) 700 (masters), 702 (non-thesis masters), or 800 (doctoral) level research credit each semester to track faculty advisor effort. Students should check with their departments for additional information and/or exceptions to this policy.

Part-time Students

Graduate students must register for a minimum of 2 credit hours and no more than 9 credit hours to maintain part-time enrollment status in the fall and spring semesters.

Instructions for registration and policies and procedures for dropping and adding classes are included in the time schedule of classes available on the Registrar's Office homepage at www.registrar.wsu.edu.

Continuous Enrollment

All full and part-time degree seeking graduate students at all campus locations must maintain continuous enrollment in the Graduate School, registering for each semester, excluding summer sessions, for the time of first enrollment until all requirements for the degree are completed.

Continuous enrollment is maintained by registering for a minimum of 2 graduate credits per semester (excluding the summer). International students who enroll for fewer than 10 credits must be approved by OISS, in consultation with the Graduate School, prior to part-time enrollment during the academic year. Exceptions to the continuous enrollment policy are noted in Section A.2.b. Continuous doctoral status, explained in Section A.2.a meets the continuous enrollment requirement.

Exceptions to Continuous Enrollment

Typically, degree-seeking graduate students enroll in credits every semester until degree completion. However, sometimes circumstances are such that degree-seeking students are unable to enroll for credits. Such circumstances may include illness, family issues, financial need, work, or other obligations.

The exceptions to continuous enrollment discussed in this section address circumstances in which a degree-seeking student must be away from campus and cannot enroll for credits. These students must complete the appropriate graduate leave or internship leave paperwork, obtain approval from their faculty advisor and program chair, and submit the paperwork to the Graduate School in advance of the semester they will be away. Official leaves of absence, internship leave status, and absences not approved under this policy are included in the time limits to complete a degree.

1. Graduate Leave of Absence

Students who must be away from campus for reasons such as medical issues, family obligations, job obligations, military service, and Peace Corps service, and who cannot maintain continuous enrollment in any given semester, may apply for an official graduate leave of absence. See Section A.6 for additional information and procedures. Only graduate leave for medical reasons (EFML), military service, and Peace Corps service is available to doctoral students in continuous doctoral status. Students who are approved for graduate leave while in continuous doctoral status will not be charged the $50 administrative fee.

2. Internship Leave

Students who wish to go on an internship approved by their program and who do not need to register for credits for the internship may apply for internship leave status. See Section A.7 for information and procedures. Only internship leave required by the student's program is available to doctoral students in continuous doctoral status. Students who are approved for internship leave while in continuous doctoral status will not be charged the $50 administrative fee.

3. Short-term Parental Leave

The Short-term Parental Leave plan provides up to four consecutive weeks of leave for the period directly before or after the birth or adoption of a child. During this time, the student continues to be enrolled and, if on an assistantship appointment, the student will continue to receive graduate assistant benefits (i.e., tuition waivers will remain in place, health benefits, and his/her salary).

Other Policies and Procedures

Special Projects or Independent Study (600), Master's Research, Thesis and/or Examination (700), Master's Special Problems, Directed Study, and/or Examination (702), and Doctoral Research, Dissertation, and/or Examination (800) shall have as pre-requisite regular or provisional student status in the Graduate School.

Graduate students must register for the required amount of 700, 702, or 800 credit during the semester or summer session in which they take their final examination. Fall and spring semesters and summer session officially end at the last day of finals week. Examinations normally are not scheduled between regular terms. However, students who have received special permission from the Graduate School to schedule final master's or doctoral oral examinations in the interim nonclass period after the end of a term will be required to register for the following semester or summer session.

Academic Regulations

Academic Regulations

Scholarship Standards

A student must earn a 3.00 grade point average for all course work (including all courses listed on the program and other graduate upper- and lower-division courses). No work of C grade or less may be dropped from a program, nor can a course be repeated for a higher grade if the final grade is C or higher. Any course listed on the program in which a grade of C-, D, or F is earned must be repeated.

Any graduate student who fails to maintain a cumulative grade point average of 3.00 or higher for all course work subsequent to admission to the Graduate School will be dropped from the University. A student who is dropped may be permitted to re-enroll if the chair of the major department makes a special recommendation with the concurrence of the Dean of the Graduate School.

Requirements for a Graduate Degree

The graduation requirements of the Graduate School (as published in the Graduate School Policies and Procedures Manual) in effect at the time of the student's initial admission as a regular or provisional graduate student must be met for completion of a graduate degree program.

Subsequent changes in degree requirements of the Graduate School or in departmental requirements of the Graduate School or in departmental requirements may be substituted at the option of the student upon approval by the master's or doctoral committee, by the department chair, and by the Dean of the Graduate School.

If a student is dropped from the University for failure to maintain continuous enrollment, the graduation requirements of the Graduate School are those in effect at the time of readmission.

The time limit for the use of graduate credits toward a master's degree is six years from the beginning date of the earliest course applied toward the degree.

Each program for a doctoral degree is considered individually. In all cases, work for the degree must be completed within three years of the date of the satisfactory completion of the preliminary examination. At least four months must elapse between preliminary and final examinations for doctoral degrees.

Transfer Credit and Credit Restrictions

Detailed policies and procedures on transfer credit and credit restrictions are outlined in the Graduate School Policies and Procedures Manual.

Transfer of Graduate Credits

Appropriate credits (with a grade of B or higher) earned in other accredited graduate schools may be applied to a limited extent toward an advanced degree; however, they may not be substituted for residence requirements.

Graduate Work through Continuing Education

Credit earned in graduate-level courses taken through the Center for Distance and Professional Education will be accepted on graduate student programs without limit subject only to customary program approvals. No extension credits from other institutions, or work done by correspondence with this or any other institution, or credit earned by special examination may be used to meet advanced degree requirements.

Graduate Study by Seniors

Seniors who have at least a 3.00 grade point average in the last half of their undergraduate work at Washington State University may register for up to six semester hours of work in the Graduate School in excess of the number of hours required to complete the bachelor's degree. Graduate School approval is required at the time of registration. Only grades of "B" or higher may be applied toward an advanced degree. Seniors who wish to enroll in 500-level courses for undergraduate credit must obtain approval of the major advisor and the chair of the department of program in which the course is offered.

Tuition and Fees

Tuition and Fees

Tax revenue from the state finances a portion of the facilities and operations of the instructional programs, student services, and related activities. Graduate students share in the cost by paying tuition, fees, and other charges as established by the Board of Regents.

Tuition, fees, and other charges are subject to change, and are effective when established by the Legislature of the State of Washington and adopted by the WSU Board of Regents. For the most up-to-date rates, please go to: www.wsu.edu/studacct/tuition.htm.

Payment of registration fees is due on or before the fifth Friday of class. Receipt of payment after that day will result in a 5% late payment fee. Any tuition balances not paid by the eighth Friday of class will receive another 10% late payment fee.

Resident graduate tuition for the academic year 2011-2012 for more than 10 hours of enrollment is $4,426 per semester; nonresident tuition for more than 10 hours is $10,825 per semester. Part-time tuition for 9 credits or less is $443 per credit hour for residents and $1,083 per credit hour for nonresidents. Part-time students appointed to graduate assistantships may receive waivers of tuition. (See the Assistantship, Fellowship, and Traineeships section).

On the Pullman Camus, fees for the Student Health Center, the Student Recreation Center, and Pullman Transit are charged each semester. (NOTE: Graduate students appointed to half-time graduate assistantships qualify for medical insurance coverage. See Assistantships, Fellowships, and Traineeships section for more information). Other fees, including parking permits and health insurance are optional.

NOTE: Overdue accounts owed to the University will prevent release of transcripts and enrollment. Registration is not complete until all of the student's tuition and fees are paid.

Student Financial Aid Programs

Financial Aid

Graduate students wishing to apply for financial aid must complete the Free Application for Federal Student Aid (FAFSA). The FAFSA priority processing date is March 1. Students may apply on-line at www.fafsa.ed.gov or pick up a paper version at any local high school, community college, public library, or the Washington State University Office of Student Financial Aid and Scholarship Services (OFSA/OSS), 380 Lighty Student Services Building.

Graduate students are considered for the following programs: Federal Family Educational Loans (subsidized and unsubsidized Stafford loans) and Federal or State Work Study Programs. Work Study Program funds may be used toward funding graduate assistantships. The Office of Student Financial Aid determines student eligibility for these programs. Letter of eligibility will notify students. Financial aid counselors are available to assist students and families with their financial aid concerns at 509-335-9711. You will also find information at: www.wsu.edu/studacct/finaid.htm.

Each academic year, a number of graduate students at WSU are awarded a graduate assistantship from their departments. The assistantship usually covers the majority of tuition costs. This Operating Fee Waiver is considered a resource when the OSFA determines the student's eligibility for other financial aid programs. In order to ensure your Financial Aid Award Notification is correct, please notify the OSFA if your department has granted you an Operating Fee Waiver. If the OSFA is notified after the first disbursement of your loan, any subsequent disbursement may be reduced accordingly.

NOTE: All graduate awards are initially based on resident tuition costs, regardless of resident status. You may request (in writing) an adjustment for nonresident tuition costs. If you have unmet need on your Financial Aid Award Notification and/or the Cost of Attendance has not been met, you may qualify to borrow an Alternative Loan. Contact the OSFA for more information.

Short-term loans may be available to students who encounter delays in their financial aid delivery through the OSFA.

Satisfactory Academic Progress (SAP) Policies

To receive and continue to be eligible to receive financial aid, graduate students must be in good standing with their department and the Graduate School. Note: The maximum time frame calculation is based on all semesters of enrollment regardless of whether or not financial aid was received each semester. Semesters in which enrollment is less than 10 hours will be counted as one-half of a full-time semester.

The maximum time frame for financial aid (exclusive of graduate assistance) is: three years (6 full-time semesters) for Master's degree candidates; three years (6 full-time semesters) for Doctoral degree candidates who have a previous master's degree; six years 912 full-time semesters) for Doctoral candidates without a Master's degree; and five years (10 full-time semesters) for professional students and veterinary medicine students.

Assistantships, Fellowships and Traineeships

Teaching and research assistantships are available in most departments offering advanced degrees, and nonservice research fellowships and traineeships are granted in some departments. Ordinarily, graduate appointments are limited to those who pursue programs of study leading to advanced degrees at Washington State University.

The Graduate School Policies and Procedures Manual should be consulted concerning qualifications, eligibility, and application procedures. As most appointments for fall semester are made by April 1, or as soon thereafter as possible, it is desirable to have applications completed by February 1; nonservice appointment applications should be completed by January 1. Spring semester applications should be completed by September 1. Applications received at a later date can be considered only for positions still available. Assistantship appointments require part-time service. The term of a graduate appointment may be for a nine-month period, a semester, or a summer. Students on appointment must maintain regular enrollment in the Graduate School (10 credit hours or more during the academic year; 3 credit hours during summer session) for the duration of their appointments. Stipends vary according to the amount of required service, the extent of the student's training, and merit factors (e.g., academic record, experience). Contact the Graduate School Office for salary information.

Graduate students, who are not residents of the State of Washington, appointed to assistantships of one-half time service (20 hours per week) or more by the Board of Regents, and who reside in the State of Washington while attending WSU, may receive a waiver of the nonresident portion of the tuition. (NOTE: Nonresident tuition waivers cannot be assured beyond the first year of graduate students' assistantship. Students who intent to remain in the state are encouraged to review Washington statutes and associated administrative rules governing the establishment of residency for tuition purposes. These may be obtained from the Office of Student Affairs, the Graduate School, or at: www.gradschool.wsu.edu/FutureStudents/StudentLife/Residency.aspx .

The residency operating fee may also be waived for resident students who hold half-time (or greater) service appointments (20 hours per week) and who qualify based on merit factors, and for nonresident students who reside in the State of Washington, who hold half-time graduate service appointments and who qualify based on merit factors. Further, graduate students who hold half-time (or greater) service appointments automatically qualify for and receive medical insurance coverage.

All students on assistantships pay the general tuition and activities fees. (Please note: to be eligible for any waiver, a student must be physically living in the State of Washington).

Forms for assistantship or fellowship applications are included as part of the general application for admission to Graduate School. For information about special scholarships and fellowships, write to the Dean of the Graduate School or the chair of the department concerned.

Resolution regarding Scholars, Fellows, Trainees, Assistants

Acceptance of an offer of financial support (such as a graduate scholarship, fellowship, traineeship, or assistantship) for the next academic year by a prospective or enrolled graduate student completes an agreement that both student and graduate school expect to honor. In that context, the conditions affecting such offers and their acceptance must be defined carefully and understood by all parties. Students are under no obligation to respond to offers of financial support prior to April 15; earlier deadlines for acceptance of such offers violate the intent of this Resolution. In those instances in which a student accepts an offer before April 15, and subsequently desires to withdraw that acceptance, the student may submit in writing a resignation of the appointment at any time through April 15. However, an acceptance given or left in force after April 15 commits the student not to accept another offer without first obtaining a written release from the institution to which the commitment has been made. Similarly, an offer by an institution after April 15 is conditional on presentation by the student of the written release from any previously accepted offer. It is further agreed by the institutions and organizations subscribing to the above Resolution that a copy of this Resolution should accompany every scholarship, fellowship, traineeship, and assistantship offer.

Courses listed in this catalog are subject to change through normal academic channels. New courses and changes are initiated by the corresponding departments or programs, approved through the appropriate academic dean, the Catalog Subcommittee, the Academic Affairs or Graduate Studies Committees, and the University Senate.

Additions to the curriculum for the ensuing year are published each fall in the Catalog Supplement within the Fall Time Schedule. It is the obligation of the student to be acquainted with all the pertinent information in this Catalog and the Graduate School Policies and Procedures Manual to see that all departmental requirements are satisfied.

Departments, Programs, and Courses

Explanation of SYMBOLS

2	Figure following course title indicates the hours of credit and the number of lectures per week.
( )	Hours of lecture and laboratory required each week during the semester, with lecture being the first figure and laboratory the second.
(a/y)	Indicates alternate years.
c//	Indicates concurrent enrollment.

Courses listed in this catalog are subject to change through normal academic channels. New courses and changes are initiated by the cognizant departments or programs, approved through the appropriate academic dean, the Catalog Subcommittee, the Academic Affairs or Graduate Studies Committees, and the University Senate. Additions to the curriculum for the ensuing year are published each fall in the Catalog Supplement within the Fall Time Schedule. It is the obligation of the student to be acquainted with all the pertinent information in this Catalog and the Graduate School Policies and Procedures Manual to see that all departmental requirements are satisfied.

Accounting - Accounting (Pullman)

Degree offered: Master of Accounting

Faculty working with graduate students: 2

Graduate students: 30

Graduate students receiving assistantships or scholarships: 10%

Tests required: GMAT, IELTS, MELAB, Pearson, TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Program Description

The Master of Accounting degree prepares students for careers as professional accountants in financial institutions, government, industry, nonprofit organizations, and public practice. The Master of Accounting degree program is a 32 credit hour general program of study that exposes students to accounting research and theory. The Pullman campus has a focus on audit and assurance while the Vancouver campus has a focus on taxation.

Degree Description

The Master of Accounting Pullman program has an audit and assurance focus. The degree prepares students for careers as professional accountants in financial institutions, government, industry, nonprofit organizations, and public practice. The Master of Accounting degree is a 32 credit hour program that exposes students to technical accounting topics and emphasizes professional accounting research and writing skills.

Training and Professional Development Opportunities

Greater breadth and depth in taxation and accounting than is possible in baccalaureate or general business degree programs. Additional preparation for the CPA examination. Additional credit hours targeted to meet the 150 credit hours necessary for CPA examination eligibility. Small class sizes.

Post-Graduate Employment Opportunities

Entry level positions in financial institutions, government, industry, nonprofit organizations, and directly enter tax departments of public accounting firms.

Contact Information

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Graduate Programs, College of Business
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Faculty

Susan Gill and Debra Sanders.

ACCTG

530 **Accounting Theory** 3 Prereq Acctg 331. Recent developments with respect to the determination of income and the valuation of assets.

532 **Contemporary Accounting Cases and Problems** 3 Prereq Acctg 331. Accounting theory applied to external financial reporting practices.

535 **Advanced Taxation** 3 Prereq Acctg 335. Federal income tax impact on corporations, S corporations, partnerships, estates, trusts and their beneficial owners.

537 **Professional Research** 3 Prereq Acctg 331; Acctg 335. Methodology used by accounting professionals to research applied problems in taxation, accounting, and auditing; communicate results.

538 **Seminar in Cost/Managerial Accounting** 3 Cost concepts, cost and managerial accounting systems; current issues and research in cost and managerial accounting.

539 **Seminar in Public Accounting and Auditing** 3 Prereq Acctg 439. Public accounting and auditing to present; current issues including statistical sampling and computers.

702 **Master's Special Problems, Directed Study, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

B LAW

511 **Business Law II** 3 Prereq B Law 210 or 510. Law of partnerships, corporations, securities regulations, negotiable instruments, secured transactions, property, insurance and bankruptcy; government regulation of businesses and professions.

Accounting - Accounting (Vancouver)

Degree offered: Master of Accounting

Faculty working with graduate students: 1

Graduate students: 20

Program offered: Vancouver

Tests required: GMAT, IELTS, MELAB, Pearson, TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Program Description

The Master of Accounting degree prepares students for careers as professional accountants in financial institutions, government, industry, nonprofit organizations, and public practice. The Master of Accounting degree program is a 32 credit hour general program of study that exposes students to accounting research and theory. The Pullman campus has a focus on audit and assurance while the Vancouver campus has a focus on taxation.

Degree Description

The Master of Accounting Vancouver program has an emphasis in taxation. The degree prepares students for careers as professional accountants in financial institutions, government, industry, nonprofit organizations, and public practice. The Master of Accounting degree is a 32 credit hour program that exposes students to technical tax topics and emphasizes tax and accounting research skills.

Training and Professional Development Opportunities

Greater breadth and depth in taxation and accounting than is possible in baccalaureate or general business degree programs. Additional preparation for the CPA examination. Additional credit hours targeted to meet the 150 credit hours necessary for CPA examination eligibility. Small class sizes.

Post-Graduate Employment Opportunities

Entry level positions in financial institutions, government, industry, nonprofit organizations, and directly enter tax departments of public accounting firms.

Contact Information

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E-mail: dsanders@vancouver.wsu.edu

Faculty

Debra Sanders.

ACCTG

537 Professional Research 3 Prereq Acctg 331; Acctg 335. Methodology used by accounting professionals to research applied problems in taxation, accounting, and auditing; communicate results.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

B LAW

511 Business Law II 3 Prereq B Law 210 or 510. Law of partnerships, corporations, securities regulations, negotiable instruments, secured transactions, property, insurance and bankruptcy; government regulation of businesses and professions.

Agribusiness - Cert in Agribusiness

Degree offered: Graduate Certificate in Agribusiness

Requirements

Please see the program/department for more information.

Agricultural Economics

Degree offered: Doctor of Philosophy (Agricultural Economics)

Faculty working with graduate students: 22

Graduate students: 10

Graduate students receiving assistantships or scholarships: 30%

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal), TOEFL

Deadline: Fall: January 10

Requirements

Must successfully complete three preliminary core exams, (end of first year) Research Proposal and Seminar must complete Agricultural Economics Field; must complete one additional field; must complete one additional course elective

Program Description

This program is designed to provide the student with an excellent foundation in the theory and methods of economic analysis as well as experience in applied analysis of agricultural and/or resource economics problems. Career opportunities for agricultural economists include academia, government, and the private sector.

Degree Description

The PhD in Agricultural Economics is designed to provide the student with an excellent foundation in the theory and methods of economic analysis as well as experience in applied analysis of agricultural, agribusiness, and/or resource economics problems. Career opportunities for agricultural economists also include academia, government, and the private sector. Many academic positions (especially at land grant universities) include salary support for a combination of teaching, research, and/or outreach related to the food and fiber sectors and the natural resource base that supports them.

Training and Professional Development Opportunities

None

Post-Graduate Employment Opportunities

Academia, Government and the Private Sector

Post-Graduate Career Placements

Analysis for American Express; Risk Analyst for JP Morgan; Assistant Professor

Contact Information

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Faculty

Raymond Batina, Kenneth Casavant, Andrew Cassey, Seung Choi, Hayley Chouinard, Benjamin Cowan, Ana Espinola-Arredondo, Gregmar Galinato, Rosa Gallardo, Mark Gibson, Bidisha Mandal, Thomas Marsh, Jill McCluskey, Vicki McCracken, R Mittelhammer, Felix Munoz-Garcia, Joseph Neibergs, Robert Rosenman, C Shumway, Philip Wandschneider, Jia Yan and Jonathan Yoder.

ECONS

500 Macroeconomic Theory I 3 Prereq EconS 302; one year of calculus. Introduction to dynamics, growth and investment, overlapping generations models, Ramsey model, consumption and investment.

501 Microeconomic Theory I 3 Prereq EconS 301 or 305; one year calculus. Microeconomic theory, multivariate optimization, consumer and producer theory, competitive partial equilibrium, introduction to imperfect competition.

502 Macroeconomic Theory II 3 Prereq EconS 500. Macroeconomic theory, short-run fluctuations and nominal rigidities, monetary economics and inflation, real business cycle models, unemployment international macroeconomics.

503 Microeconomic Theory II 3 Prereq EconS 501. General equilibrium, welfare economics and social choice, market failure, game theory, economics of information.

504 Production and Consumption Economics 3 Prereq EconS 502; EconS 503. Advanced duality topics, demand and supply system modeling, financial economics and risk.

510 Statistics for Economists 3 Prereq college calculus and matrix algebra. Statistical theory underlying econometric techniques utilized in quantitative analysis of problems in economics and finance.

511 Econometrics I 3 Prereq EconS 510. Single equation linear and nonlinear models; estimation, inference, finite and asymptotic properties, effects and mitigation of violations of classical assumptions.

512 Econometrics II 3 Prereq EconS 501; EconS 511. Econometric methods for systems estimation; simultaneous equations, discrete and limited dependent variable, panel data, and time series data.

513 Econometrics III 3 Prereq EconS 502; EconS 503; EconS 512. Linear and non-linear models and maximum likelihood estimation and inference; semi-parametric and parametric methods; limited dependent variable models.

514 Econometrics IV 3 Prereq EconS 502; EconS 503; EconS 513. Constrained estimation, testing hypotheses, bootstrap resampling, BMM estimation and inference, nonparametric regression analysis, and an introduction to Bayesian econometrics.

521 Topics in Economic Sciences V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq EconS 301; EconS 302; EconS 311. Current topics in the development and application of the economic sciences.

525 Master's Econometrics 3 Prereq 3 hours in statistics. Theory and practice of multiple regression methods; applications to the study of economic and other phenomena; use of computer regression programs.

526 Master's Microeconomic Analysis 3 Prereq EconS 301 or 305; Math 171 or 202. Masters-level, calculus-based producer and consumer theory with selected managerial economics topics.

527 Mathematics for Economists 3 Prereq graduate standing. Mathematical methods applicable to economic analysis and research.

529 Research Methods V 1-2 May be repeated for credit; cumulative maximum 3 hours. Prereq graduate standing. Prepare and communicate professional-quality research with an emphasis on learning how to identify, develop, write, and present research.

531 Economic Analysis of Environmental Policies 3 Prereq EconS 301; EconS 311; EconS 330. Graduate-level counterpart of EconS 431; additional requirements. Credit not granted for both EconS 431 and 531.

532 Natural Resource Economics and Policy 3 Prereq EconS 301 or permission of instructor. Graduate-level counterpart of EconS 432; additional requirements. Credit not granted for both EconS 432 and 532.

533 International Trade and Policy 3 Prereq graduate standing. International trade theories, policies, and research issues related to world trade with emphasis on agricultural commodity markets.

534 Production Economics 3 Prereq EconS 526. Production economics theory and methods applied to problems of production response, economic optimization, technology, policy, risk and dynamics.

535 Applied Industrial Organization 3 Economic and strategic management theories and their relevance to agribusiness decision-making including empirical applications.

555 Managerial Economics for Decision Making 3 Prereq admission to MBA program. Optimal economic decision making for business in a global environment. Not open to economics graduate students.

571 International Trade 3 Prereq EconS 502; EconS 503; EconS 511. Recent developments in trade theory and policy, including international factor movements, empirical analysis of trade flows and strategic trade policies.

572 International Development 3 Prereq EconS 502; EconS 503; EconS 511. Structural and two-sector growth models of developing countries and countries in transition; empirical estimation of sources of growth.

581 Natural Resource Economics 3 Prereq EconS 502; EconS 503; EconS 511. Economic dynamics of natural resource systems.

582 Environmental Economics 3 Prereq EconS 502; EconS 503; EconS 511. Economic theory for environmental issues; externalities, property rights, and welfare analysis; policy design and implementation; non-market valuation and cost/benefit analysis.

583 Public Sector Economics 3 Prereq EconS 502; EconS 503; EconS 511. Public sector and public choice economics, including government debt and tax policy, public decision making, bureaucratic behavior and rent-seeking, with applications.

593 Applications in Microeconomic Topics 3 Prereq EconS 502, 503, 511. Applied topics in healthcare, sports, transportation and other markets.

594 Theory of Industrial Organization 3 Prereq EconS 502, 503, 511. Theory of market structure and firm behavior, including price and non-price competition, information and strategic behavior, and technological change.

596 Advanced Topics in Financial Economics V 1-6 May be repeated for credit; cumulative maximum 12 hours. Prereq EconS 500; EconS 501. Same as Fin 596.

598 PhD Research Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Prereq graduate standing. Seminar focusing on PhD students presenting their own research and critically assessing the research of other PhD students.

599 Special Topics in Economics 3 Prereq graduate standing.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Agriculture

Degree offered: Master of Science in Agriculture

Faculty working with graduate students: 28

Graduate students: 21

Program offered: DDP, Pullman

Tests required: TOEFL, TOEFLI

Deadline: Fall: November 1 (January 10 international)
Spring: May 1 (July 1 international)

Requirements

MS in Agriculture Thesis OptionComponents of the thesis option:* 21 hours minimum of graded coursework 15 hours minimum of graded coursework at the 500-level; 4 hours minimum of AGRI 700 credit; 3 hours maximum of seminar courses; 6 hours maximum in non-graduate graded coursework (300 - 400 level only)* Preparation of a formal thesis/research paper (AGRI 700 credits)*
Two-part final exam; Public seminar where student presents the results of the research project Oral exam that focuses on defense of the research project, attended by all committee members

Program Description

The M.S. in Agriculture program, offered by the College of Agricultural, Human, and Natural Resource Sciences, is designed to provide practitioners and professionals with an opportunity to strengthen and diversify their expertise in agriculture-related disciplines. The program is completely web-based and can be completed from anywhere in the world, although students may choose to take courses on the Pullman campus. Outstanding faculty participation from a diverse array of academic disciplines, including animal science, crop and soil sciences, entomology, horticulture and landscape architecture, plant pathology, food science, and economic sciences, makes the program truly interdisciplinary. With support from an advising committee, students have the opportunity to tailor their coursework to meet their personal and professional learning goals.

Degree Description

The M.S. in Agriculture program is designed to provide practitioners and professionals with an opportunity to strengthen and diversify their expertise in agriculture-related disciplines. The program is completely web-based and can be completed from anywhere in the world, although students may choose to take courses on the Pullman campus. Outstanding faculty participation from a diverse array of academic disciplines, including animal science, crop and soil sciences, entomology, horticulture and landscape architecture, plant pathology, food science, and economic sciences, makes the program truly interdisciplinary. With support from an advising committee, students have the opportunity to tailor their coursework to meet their personal and professional learning goals. To enable students to become outstanding educators and practitioners in agricultural disciplines, the program will foster the development of excellent communication and teaching skills, as well as a comprehensive understanding of research approaches used to address agricultural issues. Both thesis (research emphasis) and non-thesis (coursework emphasis) tracks are available to students pursuing the MS in Agriculture degree. In general, the thesis option requires both the successful completion of coursework, and the preparation and oral defense of the thesis based on a research project the student conducted. The thesis option is ideal for people who are interested in pursuing or expanding a professional career involving the scientific aspects of an agricultural discipline. This degree also is suitable for individuals who intend to continue their graduate education. The non-thesis option requires the completion of additional coursework, preparation of an independent project paper, a written comprehensive examination, and an oral defense of concepts discussed in the independent project paper, comprehensive exam, and relevant course work. The non-thesis option provides students who do not intend to develop comprehensive research skills with an opportunity to obtain an advanced degree of similar quality and depth as a thesis-based master's degree program. Additional coursework and the independent project/paper are substituted for the intensive thesis experience. The non-thesis option is designed for students with relevant experience in industry who are interested in expanding their expertise in a particular agricultural discipline. Knowledge acquired through this experience will likely be used by successful candidates to improve performance or expand opportunities for advancement in a current employment situation, or to support a student with redirecting their career opportunities towards a new discipline.

Post-Graduate Career Placements

Our alumni occupy positions in business and industry, production and business management, teaching, extension, federal and state government, community colleges, school administration, and as owners of independent businesses.

Contact Information

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Academic Coordinator
CAHNRS Academic Programs
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Faculty

Margaret Benson, Jay Brunner, Linda Chalker-Scott, Gary Chastagner, Hayley Chouinard, Jeffry Culbertson, Joan Davenport, Amit Dhingra, James Durfey, Rita Hummel, Pete Jacoby, Stephen Jones, Kimberlee Kidwell, Norman Knowles, Richard Koenig, H Love, John McNamara, Timothy Miller, R Mittelhammer, Kevin Murphy, Mark Nelson, Hanu Pappu, Gary Piper, Robert Rosenman, Walter Sheppard, Denise Smith, John Stark and Michael Swan.

AGRI

501 **Agriculture Master's Practicum** V 2-3 May be repeated for credit; cumulative maximum 6 hours. Prereq admission to graduate program, advisor approval. Course individually designed to provide practical participation/experience under professional supervision in areas related to student's specialization.

502 **Graduate Seminar** 3 Prereq admission to graduate program. Presentations and discussions of contemporary issues, trends, and recent research and development by graduate students, faculty, and visiting scholars.

560 **Contemporary Issues in Agricultural Technology and Policy** 3 Contemporary issues in agricultural technology and policy implications.

562 **Advanced Topics** V 1-3 May be repeated for credit; cumulative maximum 4 hours. Prereq admission to graduate program. Directed group study of selected advanced topics in agriculture and related areas.

587 **Research in Agriculture** 3 Prereq admission to graduate program. Exploration and assessment of current issues associated with domestic and international agriculture programs.

700 **Master's Research, Thesis, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 **Master's Special Problems, Directed Study, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

Agriculture

Degree offered: Master of Science in Agriculture - Non Thesis

Faculty working with graduate students: 27

Graduate students: 21

Program offered: DDP, Pullman

Tests required: TOEFL, TOEFLI

Deadline: Fall: November 1 (January 10 international)
Spring: May 1 (July 1 international)

Requirements

MS in Agriculture Non-Thesis Option Components of the non-thesis option:*
26 hours minimum of graded course work:o 17 hours minimum of graded course work at the 500-level; 4 hours minimum of AGRI 702; 3 hours maximum of seminar courses; 9 hours maximum of non-graduate graded course work credit (300 - 400 level only)* Independent project and paper (AGRI 702 credits)*
Comprehensive exam, which typically consists of two to four questions answered in writing without the aid of notes, books or other reference materials. The comprehensive exam typically takes 4 - 8 hours to complete.* Final oral exam with the committee focusing on comprehensive exam responses, the independent project, and course content.

Program Description

The M.S. in Agriculture program, offered by the College of Agricultural, Human, and Natural Resource Sciences, is designed to provide practitioners and professionals with an opportunity to strengthen and diversify their expertise in agriculture-related disciplines. The program is completely web-based and can be completed from anywhere in the world, although students may choose to take courses on the Pullman campus. Outstanding faculty participation from a diverse array of academic disciplines, including animal science, crop and soil sciences, entomology, horticulture and landscape architecture, plant pathology, food science, and economic sciences, makes the program truly interdisciplinary. With support from an advising committee, students have the opportunity to tailor their coursework to meet their personal and professional learning goals.

Degree Description

The M.S. in Agriculture program is designed to provide practitioners and professionals with an opportunity to strengthen and diversify their expertise in agriculture-related disciplines. The program is completely web-based and can be completed from anywhere in the world, although students may choose to take courses on the Pullman campus. Outstanding faculty participation from a diverse array of academic disciplines, including animal science, crop and soil sciences, entomology, horticulture and landscape architecture, plant pathology, food science, and economic sciences, makes the program truly interdisciplinary. With support from an advising committee, students have the opportunity to tailor their coursework to meet their personal and professional learning goals. To enable students to become outstanding educators and practitioners in agricultural disciplines, the program will foster the development of excellent communication and teaching skills, as well as a comprehensive understanding of research approaches used to address agricultural issues. Both thesis (research emphasis) and non-thesis (coursework emphasis) tracks are available to students pursuing the MS in Agriculture degree. In general, the thesis option requires both the successful completion of coursework, and the preparation and oral defense of the thesis based on a research project the student conducted. The thesis option is ideal for people who are interested in pursuing or expanding a professional career involving the scientific aspects of an agricultural discipline. This degree also is suitable for individuals who intend to continue their graduate education. The non-thesis option requires the completion of additional coursework, preparation of an independent project paper, a written comprehensive examination, and an oral defense of concepts discussed in the independent project paper, comprehensive exam, and relevant course work. The non-thesis option provides students who do not intend to develop comprehensive research skills with an opportunity to obtain an advanced degree of similar quality and depth as a thesis-based master's degree program. Additional coursework and the independent project/paper are substituted for the intensive thesis experience. The non-thesis option is designed for students with relevant experience in industry who are interested in expanding their expertise in a particular agricultural discipline. Knowledge acquired through this experience will likely be used by successful candidates to improve performance or expand opportunities for advancement in a current employment situation, or to support a student with redirecting their career opportunities towards a new discipline.

Post-Graduate Career Placements

Our alumni occupy positions in business and industry, production and business management, teaching, extension, federal and state government, community colleges, school administration, and as owners of independent businesses.

Contact Information

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Academic Coordinator
CAHNRS Academic Programs
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E-mail: katem@wsu.edu

Faculty

Margaret Benson, Jay Brunner, Linda Chalker-Scott, Gary Chastagner, Hayley Chouinard, Jeffry Culbertson, Joan Davenport, James Durfey, Rita Hummel, Pete Jacoby, Stephen Jones, Kimberlee Kidwell, Norman Knowles, Richard Koenig, H Love, John McNamara, Timothy Miller, R Mittelhammer, Kevin Murphy, Mark Nelson, Hanu Pappu, Gary Piper, Robert Rosenman, Walter Sheppard, Denise Smith, John Stark and Michael Swan.

AGRI

501 **Agriculture Master's Practicum** V 2-3 May be repeated for credit; cumulative maximum 6 hours. Prereq admission to graduate program, advisor approval. Course individually designed to provide practical participation/experience under professional supervision in areas related to student's specialization.

502 **Graduate Seminar** 3 Prereq admission to graduate program. Presentations and discussions of contemporary issues, trends, and recent research and development by graduate students, faculty, and visiting scholars.

560 **Contemporary Issues in Agricultural Technology and Policy** 3 Contemporary issues in agricultural technology and policy implications.

562 **Advanced Topics** V 1-3 May be repeated for credit; cumulative maximum 4 hours. Prereq admission to graduate program. Directed group study of selected advanced topics in agriculture and related areas.

587 **Research in Agriculture** 3 Prereq admission to graduate program. Exploration and assessment of current issues associated with domestic and international agriculture programs.

700 **Master's Research, Thesis, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 **Master's Special Problems, Directed Study, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

American Studies

Degree offered: Doctor of Philosophy (American Studies)

Faculty working with graduate students: 22

Graduate students: 19

Graduate students receiving assistantships or scholarships: 73%

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Degree Description

The Doctor of Philosophy Degree (Ph.D.) in American Studies at Washington State University requires a previous Master's Degree in American Studies, History, English, Ethnic Studies, Women's Studies, or a related discipline in the social sciences or the humanities. The degree aims to achieve both breadth of knowledge in US cultural history, and depth of knowledge in an interdisciplinary area of specialization. The Program in American Studies requires that the Ph.D. include a total of seventy-two (72) credit hours beyond the BA, including transfer credits (up to 17 from an MA degree) , research, and dissertation credits. A minimum total of thirty-four (34) must be graded credit hours in graduate courses.

Training and Professional Development Opportunities

While most of our graduate students enter careers in university and college teaching, an American Studies advanced degree can also be utilized as a useful preparation for community activism, museum and archive work, traditional and electronic publishing, and government service, among other careers.

Faculty

Mary Bloodsworth-Lugo, Kimberly Christen, Patricia Ericsson, Luz-Maria Gordillo, Lisa Guerrero, Linda Heidenreich, Wendy Johnson, C King, David Leonard, Carmen Lugo-Lugo, Laurie Mercier, Judy Meuth, Pavithra Narayanan, Rory Ong, Paula Price, Thomas Reed, Marian Sciachitano, Nishant Shahani, John Streamas, Noel Sturgeon, Pamela Thoma and Victor Villanueva.

AM ST

470 Literature and Culture of the American West 3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of one Tier I and three Tier II courses. Same as Engl 470.

471 Cultural Politics Since World War II 3 American popular culture, politics and culture of the 1960s, or topics in recent cultural politics.

472 Ecological Issues and American Nature Writing 3 Prereq completion of one Tier I and three Tier II courses. Representation of nature in American fiction and nonfiction; role of culture in shaping environmental problems and solutions.

473 Arts in American Cultures 3 Prereq completion of one Tier I and three Tier II courses. Exploration of visual culture–from fine arts to advertising–as a political, sociological, psychological, and philosophical influence in 20th-century American cultures.

474 Social Movements and US Culture 3 Prereq junior standing. Cultural impact of selected social movements such as abolition, populism, labor, women's, ethnic power, gay/lesbian and anti-globalization.

475 Digital Diversity 3 Prereq junior standing; completion of one Tier I and three Tier II courses. Cultural impact of electronic media, especially the World-Wide Web; issues of race, class, gender, sexuality online.

500 Colloquium 1 May be repeated for credit; cumulative maximum 12 hours. Current research in American studies.

501 Readings in American Studies I 3 May be repeated for credit; cumulative maximum 6 hours. Readings in key texts in American culture, beginnings to 1865.

502 Readings in American Studies II 3 May be repeated for credit; cumulative maximum 9 hours. Readings in key texts in American culture, 1865 to present.

503 Contemporary Theories of Race and Ethnicity 3 Prereq graduate standing. Major theoretical readings and key recent texts in U.S. and transnational ethnic studies scholarship.

504 Contemporary Feminist Theories and Practices 3 Prereq graduate standing. Major theoretical readings and key recent texts in U.S. and transnational feminist scholarship.

513 Theory and Method in American Studies 3 Major theories and methods currently used by American studies scholars; key concepts in cultural analysis.

514 Interdisciplinary Research Methods 3 Major methods used in interdisciplinary cultural analysis including critical ethnography, oral history, rhetorical and textual analysis and other qualitative approaches.

520 Colonization, Globalization and Decolonization 3 Topics in the critical study of colonialism, neo-colonialism, imperialism, globalization and resistance to these forces.

521 Critical Studies in Sexuality 3 Topics in the critical analysis of normative sexualities and forces shaping US and global cultures.

522 Digital Cultures, Digital Divides 3 Critical analysis of the social and cultural dimensions of the "digital divide" and use of digital technologies by dominant and subaltern communities.

523 Environmental Justice Cultural Studies 3 Critical analysis of the cultural dimensions of environmental justice and injustice.

524 Culture Studies in Popular Culture 3 Interdisciplinary approaches to historical and contemporary trends and issues in US popular culture.

525 Social Movements in American Studies 3 Theoretical and historical study of the role of social movement in United States culture.

590 Seminar in American Studies 3 May be repeated for credit; cumulative maximum 9 hours. Interdisciplinary topics in American culture.

596 Topics in American Studies 3 May be repeated for credit; cumulative maximum 9 hours. American Studies Summer Institute.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

American Studies

Degree offered: Master of Arts in American Studies

Faculty working with graduate students: 22

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Degree Description

The program for the Master of Arts (M.A.) in American Studies at Washington State University is designed to provide a broad background in American Culture Studies. In consultation with their advisor, candidates are expected to assemble a range of courses and independent study in American ethnic studies, literature, history, women's studies, and related fields that will provide them with a broad knowledge of US culture and of current approaches to cultural interpretation.1) TRADITIONAL

THESIS: Students taking the thesis option write a thesis (typically 75-125 pages) synthesizing material on an American Studies topic they choose in consultation with their degree committee. (Examples of previous theses are available in the Coordinator's office.) Approval of the thesis occurs after a final oral exam conducted by the student's degree committee, and constitutes completion of the degree, presuming all course, exam and language requirements have been met.As alternatives to the traditional written, analytic thesis, two optional thesis formats are approved.2) ELECTRONIC/MULTIMEDIA THESIS: Increasingly the World Wide Web and other elements of electronic communication are reshaping the possibilities for scholarly work and publishing. Recognizing this, we offer a unique "electronic/multimedia" option within the M.A. that allows students to take advantage of the capabilities of electronic communication to enhance their thesis. We expect this option to be used by students with a strong interest in computer-mediated pedagogy, and by students who plan on careers in the field of electronic publishing or other areas of techno-cultural production like film, animation or the World Wide Web. We especially encourage women students and students of color, two groups seriously underrepresented in electronic culture fields (given various "digital divides"), to consider this option. For students wishing to enter computer-mediated cultural production fields, the multimedia thesis is designed to serve as an employment portfolio. Parameters of the thesis or portfolio project will be set by the student in consultation with their M.A. committee, and with approval of the Advisory Committee. But it is assumed that the most appropriate use of this option will be for those projects that will be significantly enhanced by presentation in the multimedia electronic formats, such as work on visual or aural culture. Students and faculty interested in the possibilities for "electronic scholarship" might wish to examine the web-based "articles" for the special hypertext issue of American Quarterly.3) CREATIVE THESIS: Students who can demonstrate that their intellectual work can be presented best in a "creative" format, using poetry, fiction, film or another medium, may do so with consent of their degree committee and the Advisory Committee. Normally, the creative material will be surrounded by additional material in traditional analytical format. The M.A. program, to be filed with the graduate school, must include a minimum of thirty (30) post-BA credit hours, at least twenty-six (26) of which must be in graded courses.

Training and Professional Development Opportunities

While most of our graduate students enter careers in university and college teaching, an American Studies advanced degree can also be utilized as a useful preparation for community activism, museum and archive work, traditional and electronic publishing, and government service, among other careers.

Faculty

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AM ST

470 Literature and Culture of the American West 3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of one Tier I and three Tier II courses. Same as Engl 470.

471 Cultural Politics Since World War II 3 American popular culture, politics and culture of the 1960s, or topics in recent cultural politics.

472 Ecological Issues and American Nature Writing 3 Prereq completion of one Tier I and three Tier II courses. Representation of nature in American fiction and nonfiction; role of culture in shaping environmental problems and solutions.

473 Arts in American Cultures 3 Prereq completion of one Tier I and three Tier II courses. Exploration of visual cultureâ"from fine arts to advertisingâ"as a political, sociological, psychological, and philosophical influence in 20th-century American cultures.

474 Social Movements and US Culture 3 Prereq junior standing. Cultural impact of selected social movements such as abolition, populism, labor, women's, ethnic power, gay/lesbian and anti-globalization.

475 Digital Diversity 3 Prereq junior standing; completion of one Tier I and three Tier II courses. Cultural impact of electronic media, especially the World-Wide Web; issues of race, class, gender, sexuality online.

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524 Culture Studies in Popular Culture 3 Interdisciplinary approaches to historical and contemporary trends and issues in US popular culture.

525 Social Movements in American Studies 3 Theoretical and historical study of the role of social movement in United States culture.

590 Seminar in American Studies 3 May be repeated for credit; cumulative maximum 9 hours. Interdisciplinary topics in American culture.

596 Topics in American Studies 3 May be repeated for credit; cumulative maximum 9 hours. American Studies Summer Institute.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

American Studies

Degree offered: Master of Arts in American Studies - Non Thesis

Faculty working with graduate students: 22

Graduate students: 1

Graduate students receiving assistantships or scholarships: 100%

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Degree Description

The program for the Master of Arts (M.A.) in American Studies at Washington State University is designed to provide a broad background in American Culture Studies. In consultation with their advisor, candidates are expected to assemble a range of courses and independent study in American ethnic studies, literature, history, women's studies, and related fields that will provide them with a broad knowledge of US culture and of current approaches to cultural interpretation. Students who choose the portfolio instead of any of the thesis options must complete the following: 1. One publishable paper based upon graduate level research, preferably a paper which has been presented at a conference. A short cover letter for the paper should identify possible venues for publication as well as locate the paper's relationship to the student's overall academic preparation for presenting such a paper. The paper may be a revised seminar paper from work in core classes, a paper concerning the student's area of emphasis, or a general seminar paper or academic writing project prepared for publication. It is expected that selection and preparation of the paper will be accomplished over time in consultation with members of the student's degree committee, and 2. A position paper of 8-10 pages, written after completing the core courses required of master's students. In the position paper, the student will focus either on an area of emphasis or an area of specialization, not both, and clarify how course work in the core compliments or expands upon the work completed in an area of specialization or emphasis.

Training and Professional Development Opportunities

While most of our graduate students enter careers in university and college teaching, an American Studies advanced degree can also be utilized as a useful preparation for community activism, museum and archive work, traditional and electronic publishing, and government service, among other careers.

Contact Information

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Faculty

Mary Bloodsworth-Lugo, Kimberly Christen, Patricia Ericsson, Luz-Maria Gordillo, Lisa Guerrero, Linda Heidenreich, Wendy Johnson, C King, David Leonard, Carmen Lugo-Lugo, Laurie Mercier, Judy Meuth, Pavithra Narayanan, Rory Ong, Paula Price, Thomas Reed, Marian Sciachitano, Nishant Shahani, John Streamas, Noel Sturgeon, Pamela Thoma and Victor Villanueva.

AM ST

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473 Arts in American Cultures 3 Prereq completion of one Tier I and three Tier II courses. Exploration of visual culture–from fine arts to advertising–as a political, sociological, psychological, and philosophical influence in 20th-century American cultures.

474 Social Movements and US Culture 3 Prereq junior standing. Cultural impact of selected social movements such as abolition, populism, labor, women's, ethnic power, gay/lesbian and anti-globalization.

475 Digital Diversity 3 Prereq junior standing; completion of one Tier I and three Tier II courses. Cultural impact of electronic media, especially the World-Wide Web; issues of race, class, gender, sexuality online.

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524 Culture Studies in Popular Culture 3 Interdisciplinary approaches to historical and contemporary trends and issues in US popular culture.

525 Social Movements in American Studies 3 Theoretical and historical study of the role of social movement in United States culture.

590 Seminar in American Studies 3 May be repeated for credit; cumulative maximum 9 hours. Interdisciplinary topics in American culture.

596 Topics in American Studies 3 May be repeated for credit; cumulative maximum 9 hours. American Studies Summer Institute.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Animal Sciences

Degree offered: Doctor of Philosophy (Animal Sciences)

Faculty working with graduate students: 19

Graduate students: 22

Graduate students receiving assistantships or scholarships: 90%

Tests required: GRE (Combined), TOEFL

Deadline: Fall: January 10
Spring: July 1

Requirements

Degree requirements are specific to the discipline in which the student is studying.

Program Description

The Department of Animal Sciences is an interdisciplinary department, bringing together expertise from different disciplines for the solution of problems in animal biology and animal production. Research in the department covers a continuum from basic to applied with an emphasis on animal biology. Students may choose to focus on the areas of: nutrition-environmental sciences, reproductive physiology-endocrinology, genetics, animal breeding, muscle biology, meat science, cell biology, and animal behavior.

Degree Description

Animal Sciences offers graduate work leading to the Doctor of Philosophy degree with a major in animal science. Programs are flexible and designed to meet the needs and interests of the student and, as such, specific degree requirements are determined through individual consultation with an advisor and a special committee. The department maintains herds of dairy cattle, beef cattle, and swine for research and teaching purposes.

Training and Professional Development Opportunities

Graduates from our program are employed in a wide range of careers from applied animal production to teaching and research of molecular mechanisms in domestic and companion animals, as well as humans. Graduate students acquire cutting-edge knowledge and techniques in disciplines that are vital to the improvement of quality of life for animals and humans. Examples of ongoing fundamental research include: the use of mammalian comparative and functional genomics in the search for genes of economic significance including identification of genes involved in disease resistance as well as production traits; understanding molecular events coordinating the physiology of uterine and testis biology using the mouse and domestic ruminants as model organisms; understanding and enhancing skeletal and cardiac muscle growth and development with stem cell and gene therapy approaches; developing deterministic models to evaluate the environmental impact of dairy and beef production systems; and examination of the bovine genome to examine the genetic x nutrition interactions associated with feed efficiency in beef cattle. Examples of important applied research include minimizing the impact of animals on the environment; altering animal nutrition to enhance meat quality; and strategies to understand and enhance animal behavior and well-being. The department's dairy, feedlot, beef cow-calf unit, swine center, feed mill, research laboratories, experimental animal building, and meats laboratory provide the foundation for the department's bench-to-application approach.Opportunities:Industry internshipsNSF IGERT Program: NSPIRE: Nitrogen Systems Policy-oriented Integrated Research and Education

Post-Graduate Employment Opportunities

University faculty; National agricultural laboratories Postdoctoral positions in prestigious laboratories Management, allied and agricultural industries Extension and technical positions; Teaching positions

Post-Graduate Career Placements

Research scientist, Agricultural Research Service, Miles City, MT Research scientist, USDA Human Nutrition Lab, Grand Forks, ND Associate professor, Kansas State University, Endocrinologist, National Zoo Postdoctoral fellow, University of Pennsylvania, Philadelphia, International consulting Worldwide Genetic Resources Postdoctoral fellow at Alltech Inc., International and Biotechnology Postdoctoral fellows Teaching positions at 4-yr schools Animal behavior scientist at Nestle Purina

Contact Information

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Animal Sciences
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Pullman, WA 99164-6351
Telephone: 509-335-4131
Fax: 509-335-1082
E-mail: johnsoka@wsu.edu

Faculty

Margaret Benson, Jan Busboom, Judith Capper, Michael Dodson, Lawrence Fox, Joseph Harrison, Zhihua Jiang, Kristen Johnson, Ronald Kincaid, Derek McLean, John McNamara, Holly Neibergs, Donald Nelson, Mark Nelson, Ruth Newberry, James Pru, Buel Rodgers, Thomas Spencer and Raymond Wright.

Animal Sciences

A S

500 Seminar in Animal Sciences 1 May be repeated for credit. Current developments in animal sciences.

504 Special Topics V 1-4 May be repeated for credit; cumulative maximum 12 hours.

507 Advanced Nutrient Metabolism 3 Prereq FSHN course; MBioS 303. Advanced topics in metabolic regulation of carbohydrate, fat and amino acid use by animals.

510 Digestion and Nutrient Utilization in Animals 3 (2-3) Prereq FSHN course. Gastrointestinal physiology, rate of passage, feed intake regulation, measures of digestibility, starch, fat and nonstarch polysaccharide, and digestion and utilization of nutrients.

513 Mineral and Vitamin Metabolism 4 Prereq FSHN course; MBioS 303. Absorption, excretion, metabolism, dietary requirements and interactions of minerals and vitamins in animals and humans.

520 Preparation of Scientific Literature in Animal Sciences 2 Preparation of grant proposals, manuscripts, and literature reviews on research topics.

528 Topics in Animal Breeding 2 May be repeated for credit; cumulative maximum 4 hours. Prereq graduate standing. Systems of selection and mating for genetic improvement in farm animals.

551 Endocrine Physiology 3 Graduate-level counterpart of A S 451; additional requirements. Credit not granted for both A S 451 and 551.

558 Molecular and Cellular Reproduction 3 (2-2) Same as MBioS 528.

582 Seminar in Reproductive Biology 1 Prereq graduate standing. Current developments in reproductive biology.

588 Perspectives in Biotechnology 3 Prereq MBioS 301. Graduate-level counterpart of A S 488; additional requirements.

598 Advanced Topics in Animal Sciences V 1-2 May be repeated for credit. Recent research in various disciplines of animal sciences.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Animal Sciences

STAT

512 Statistical Methods in Research II 3 (2-2) Prereq Stat 412 or equivalent. Analysis and interpretation of designed experiments: CRD, RCBD, spit-plot and repeated measures, multiple comparisons, multiple regression modeling, validation of assumptions.

Animal Sciences

Degree offered: Master of Science in Animal Sciences

Faculty working with graduate students: 19

Graduate students: 22

Graduate students receiving assistantships or scholarships: 90%

Tests required: GRE (Combined), TOEFL

Deadline: Fall: January 10
Spring: July 1

Requirements

Students considering graduate study in the Department of Animal Sciences should major in animal science, biology, zoology, or closely related fields.

Program Description

The Department of Animal Sciences is an interdisciplinary department, bringing together expertise from different disciplines for the solution of problems in animal biology and animal production. Research in the department covers a continuum from basic to applied with an emphasis on animal biology. Students may choose to focus on the areas of: nutrition-environmental sciences, reproductive physiology-endocrinology, genetics, animal breeding, muscle biology, meat science, cell biology, and animal behavior.

Degree Description

Animal Sciences offers graduate work leading to the Master of Science degree with a major in animal science. Programs are flexible and designed to meet the needs and interests of the student and, as such, specific degree requirements are determined through individual consultation with an advisor and a special committee. The department maintains herds of dairy cattle, beef cattle, and swine for research and teaching purposes.

Training and Professional Development Opportunities

Graduates from our program are employed in a wide range of careers from applied animal production to teaching and research of molecular mechanisms in domestic and companion animals, as well as humans. Graduate students acquire cutting-edge knowledge and techniques in disciplines that are vital to the improvement of quality of life for animals and humans. Examples of ongoing fundamental research include: the use of mammalian comparative and functional genomics in the search for genes of economic significance including identification of genes involved in disease resistance as well as production traits; understanding molecular events coordinating the physiology of uterine and testis biology using the mouse and domestic ruminants as model organisms; understanding and enhancing skeletal and cardiac muscle growth and development with stem cell and gene therapy approaches; developing deterministic models to evaluate the environmental impact of dairy and beef production systems; and examination of the bovine genome to examine the genetic x nutrition interactions associated with feed efficiency in beef cattle. Examples of important applied research include minimizing the impact of animals on the environment; altering animal nutrition to enhance meat quality; and strategies to understand and enhance animal behavior and well-being. The department's dairy, feedlot, beef cow-calf unit, swine center, feed mill, research laboratories, experimental animal building, and meats laboratory provide the foundation for the department's bench-to-applications approach.

Post-Graduate Employment Opportunities

National agricultural laboratoriesManagement, allied and agricultural industries Extension and technical positions Teaching positions

Post-Graduate Career Placements

Research technologist, University of Washington, Seattle, WAPh.D. students at other prestigious universities Research technologist,Human Nutrition Lab Associate in Animal Sciences research, Washington State University Teaching positions Animal behaviorial scientists at Zoos

Contact Information

Kristen A Johnson, PhD
Professor
Animal Sciences
PO Box 646351
ASLB 126
Pullman, WA 99164-6351
Telephone: 509-335-4131
Fax: 509-335-1082
E-mail: johnsoka@wsu.edu

Faculty

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Animal Sciences

A S

500 Seminar in Animal Sciences 1 May be repeated for credit. Current developments in animal sciences.

520 Preparation of Scientific Literature in Animal Sciences 2 Preparation of grant proposals, manuscripts, and literature reviews on research topics.

Animal Sciences

STAT

512 Statistical Methods in Research II 3 (2-2) Prereq Stat 412 or equivalent. Analysis and interpretation of designed experiments: CRD, RCBD, spit-plot and repeated measures, multiple comparisons, multiple regression modeling, validation of assumptions.

Anthropology

Degree offered: Doctor of Philosophy (Anthropology)

Faculty working with graduate students: 24

Graduate students: 34

Graduate students receiving assistantships or scholarships: 58%

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal), TOEFL, TOEFLI

Deadline: Fall: January 10

Requirements

Each Anthropology Graduate Program has it's own minimum number of required grade credit hours for a PhD Archaeology:56 graded credits Cultural Anthropology: 37 graded credits Evolutionary Anthropology:52 graded credits.

Program Description

Anthropology is the study of human diversity in the broadest sense. We ask and attempt to address the most basic questions about the nature or culture, the origins humans, and human variability. Anthropologists study the interactions between our biological heritage and our learned cultural heritages. Anthropologists are important components of management projects that deal with landscape development, human impact studies, cultural resouce use, crime scene investigations, and internationalization projects. In addition, anthropologists investigate the unwritten human past that accounts for over 99% of all human existence.Through world class research and instruction the anthropology department at Washington State University seeks to inform the public, students, and the profession on these aspects of human diversity. Many of our students go on to make careers in one of the sub disciplines of anthropology (bioanthropology, archaeology, cultural anthropology, and linguistics). However, many of our students that did not later pursue careers in anthropology tell us that their experiences here greatly enriched their perspectives on life and learning in other fields. Our goal is to continue to pursue an understanding of and to foster a holistic sense of the complex human condition in all of its diversity.

Degree Description

Doctor of Philosophy degrees in Anthropology are offered in archaeology, cultural anthropology and evolutionary anthropology. The Cultural Anthropology program also offers a Peace Corps Master's International Program in Environmental Anthropology and another in Public Health. Our program emphasizes a four-field approach through a series of core classes that all our graduates take in order to establish a solid foundation in Anthropology. Each program area offers specialized courses in methodological, theoretical and regional areas. Please see our departmental website for more information such as application requirements and deadlines, course requirements, and faculty research interests.
http://libarts.wsu.edu/anthro/Graduate%20Studies/gradstudies.html

Contact Information

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E-mail: jmstrunk@wsu.edu

Faculty

Robert Ackerman, William Andrefsky, John Bodley, Mary Collins, Andrew Duff, Melissa Goodman, Colin Grier, Edward Hagen, Barry Hewlett, Bonnie Hewlett, John Jones, Brian Kemp, Tim Kohler, William Lipe, Karen Lupo, Jeannette-Marie Mageo, Mark Mansperger, Nancy McKee, Courtney Meehan, Luke Premo, Marsha Quinlan, Robert Quinlan, Clare Weber and Steven Weber.

ANTH

500 Field Methods V 2 (0-6) to 8 (0-24) Prereq permission by application. Training in gathering and analyzing field data.

504 Tribal Peoples and Development 3 Global and historic perspectives on the complex issues surrounding the problem of tribal peoples and development.

510 Fundamentals of Cultural Anthropology 3 Overview of basic concepts and theory in cultural anthropology based on in-depth analysis of selected theoretical and ethnographic materials.

513 Lithic Technological Organization 4 (3-3) Methods and theory of lithic technology.

514 Ceramic Analysis 4 (3-3) Prereq graduate standing or permission of instructor. Basic concepts, methods, and approaches used in the analysis of archaeological pottery.

519 International Development and Human Resources 3 History of and recent changes in international development emphasizing anthropological perspectives.

521 Psychological Anthropology 3 Psychological and anthropological aspects of personhood, self, human development, gender, sexuality, emotion and cognition in various cultures.

528 Historical Ethnography 3 May be repeated for credit; cumulative maximum 9 hours. Culture history, ethnography, theoretical, and contemporary problems of selected culture areas.

529 Seminar in Ethnography 3 Prereq graduate standing. Methodological, stylistic and craft issues in the process and product of ethnography.

530 Archaeological Method and Theory 3 History of archaeological method and theory; analysis of current literature.

535 Cultural Resource Management 3 Prereq graduate standing. Role of archaeology in historic preservation and resource conservation; legal and institutional frameworks; research and interpretation in a CRM context.

537 Quantitative Methods in Anthropology 4 (3-3) May be repeated for credit; cumulative maximum 8 hours. Prereq undergraduate Stat course. Sampling, exploratory data analysis, inferential statistics, and use of SAS in anthropological research with emphasis on archaeology.

539 Prehistory of the Southwest 3 Prehistory of the American Southwest; emphasis on Pueblo, Mogollon and Hohokam traditions and relationships to historic native groups.

540 Prehistory of the Northwest Coast 3 Prehistoric cultures, chronologies, and interrelationships on the northwest coast of North America.

543 Prehistory of the Plateau and Basin 3 Prereq graduate standing. Archaeology of the interior Northwest and Great Basin.

545 Historical Archaeology 3 Excavation and analysis of historical archaeological sites; acculturational implications.

546 Complexity in Small Scale Societies 3 Prereq Anth 530; graduate standing. Seminar focused on classic literature and current issues relevant to complexity in small scale societies, predominately covering hunter-gatherer systems.

547 Models and Simulation 3 Models and model-building as an anthropological approach to present and past cultures.

548 Hunters and Gatherers: Past and Present 3 Prereq graduate standing. Introduction to hunter-gatherer studies in anthropology and archaeology exploring uses of evolutionary approaches to modeling and reconstructing hunter-gatherer behavior in contemporary and prehistoric contexts.

549 Settlement and Agro-Pastoralism 3 Prereq Anth 530; graduate standing. Development of settled communities and food production through evaluation of their social, economic and spatial configurations.

550 Descriptive Linguistics 3 Graduate-level counterpart of Anth 450; additional requirements. Credit not granted for both Anth 450 and 550.

554 Anthropological Field Methods Seminar 3 Prereq Anth 450 or 550. Elicitation, recording techniques and analysis of sociocultural and linguistic field data.

561 Current Trends in Physical Anthropology 3 May be repeated for credit. Prereq Anth 465. Intensive review of major current trends in physical anthropology.

562 Evolutionary Method and Theory in Anthropology and Archaeology 3 Prereq permission of instructor. A graduate-level seminar-based course focusing on the evolutionary analysis of past and present human behavior.

563 Anthropology of Life and Death 3 Prereq Anth 260. Graduate-level counterpart of Anth 463; additional requirements. Credit not granted for both Anth 463 and 563.

564 Advances in Evolution and Human Behavior 3 Prereq one biology or biological anthropology course; one upper-division behavioral science course; graduate standing. Recent trends in the study of evolution and human behavior.

565 Human Evolution 3 Prereq Anth 260. Graduate-level counterpart of Anth 465; additional requirements. Credit not granted for both Anth 465 and 565.

567 Primate Behavioral Ecology 3 Prereq one biology or biological anthropology course; junior or graduate standing. Seminar-based course focusing on evolutionary analysis of primate behavior, morphology and ecology.

569 Evolutionary Cultural Anthropology 3 Prereq graduate standing. Evolutionary nature of culture and its interactions with human biology (genes) and ecology.

570 Sediments in Geoarchaeology 4 (3-3) Sediment-forming processes, sedimentological techniques, reconstruction of Quaternary environments, and sedimentology of site-forming processes.

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576 Palynology 4 (3-3) Pollen and spore morphology, evolution, production, dispersal, and preservation; index fossils, dating, archaeology, and vegetational history. Field trip required.

581 Comparative Biology of Social Traditions 3 Prereq Anth 260 or Biol 106; senior or graduate standing. Phylogenetic and modeling perspectives used to examine the evolution of social learning and cultural transmission in humans and other animals.

591 Special Topics in Anthropology 3 May be repeated for credit; cumulative maximum 9 hours. Examination of current areas of anthropological theory and research.

593 Publishing and Professional Communication 3 Preparation of original research reports; survey of types of professional communication, and of standards and techniques.

596 IPEM Seminar 1 May be repeated for credit; cumulative maximum 6 hours. Prereq IGERT fellow. Symposia and project work sessions for the WSU/UW IGERT: Program in Evolutionary Modeling.

598 Advanced Anthropology Internship V 1 (0-3) to 15 (0-45) May be repeated for credit; cumulative maximum 15 hours. Prereq graduate standing. Participation as archaeological or cultural anthropological intern in public or private sectors; requires special arrangement with faculty advisor.

599 Archaeological Field School V 2 (0-6) to 8 (0-24) Prereq graduate standing and permission of instructor by application. Training in methods of archaeological data recovery and analysis.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Anthropology

Degree offered: Master of Arts in Anthropology

Faculty working with graduate students: 24

Graduate students: 25

Graduate students receiving assistantships or scholarships: 60%

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal), TOEFL, TOEFLI

Deadline: Fall: January 10

Program Description

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700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Apparel Design Merchandising and Textiles

Degree offered: Master of Arts in Apparel Merchandising and Textiles

Faculty working with graduate students: 8

Graduate students: 10

Graduate students receiving assistantships or scholarships: 70%

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

For students doing a thesis, a minimum of 21 graded credit hours are required. For students doing a project, a minimum of 26 graded credits are required.

Contact Information

AMDT Graduate Program
Apparel, Merchandising, Design and Textiles
PO Box 642020
Pullman, WA 99164-2020
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E-mail: amdt@wsu.edu

Faculty

Catherine Black, Linda Bradley, Ting Chi, Meriem Chida, Joan Ellis, Yoo Kwon, Karen Leonas and Carol Salusso.

Apparel, Merchandising, Design & Textiles

AMT

508 Theoretical Frameworks Underlying Scholarship 3 Exploration of current topics through readings in apparel, merchandising, and textiles.

512 Apparel Design Graduate Studio 3 Prereq AMT 508. Integration of consumer demand target market research with the development, application, and testing of prototype products for specific end uses.

517 Theory and Methods of Culture, Gender and Dress 3 Prereq graduate standing. Exploration of appearance issues, theory, and research from the perspective of social science, feminist theory, postmodern and poststructural discourses.

518 Apparel Merchandising Analysis 3 Analysis of marketing and retailing strategies, trends and technological developments in relation to business and consumer aspects within a global context.

519 Research Methods 3 Prereq graduate standing; AMT 508; graduate course in statistics or permission of instructor. Analysis and understanding of research methods, exploration of thesis topic as applicable to the fields of apparel, merchandising, design and textiles.

520 Aesthetic Analysis of Fashion Design 3 Prereq graduate standing. In-depth analysis of apparel fashion design provided through exploration of aesthetic and human perception theories within a socio-historic context.

596 Advanced Instructional Practicum 3 Prereq Univ 590 or c//. Information and direction for graduate student teaching assistants seeking professional development in classroom teaching.

598 Topics in Apparel and Textiles V 1-3 May be repeated for credit; cumulative maximum 8 hours. Current topics in apparel and textile theory and research.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Apparel, Merchandising, Design & Textiles

EDPSY

508 Educational Statistics 3 Prereq EdPsy 505. Introductory course for graduate students in applied statistics for the behavioral sciences.

Apparel, Merchandising, Design & Textiles

STAT

412 Statistical Methods in Research I 3 Prereq Stat 212, Math 140, 171, 202, or graduate standing. Intermediate statistical methods, design and analysis of research studies: completely randomized and randomized block designs, multiple regression, categorical data analysis.

512 Statistical Methods in Research II 3 (2-2) Prereq Stat 412 or equivalent. Analysis and interpretation of designed experiments: CRD, RCBD, spit-plot and repeated measures, multiple comparisons, multiple regression modeling, validation of assumptions.

Apparel Design Merchandising and Textiles

Degree offered: Master of Arts in Apparel Merch and Textiles - Non Thesis

Faculty working with graduate students: 8

Graduate students: 10

Graduate students receiving assistantships or scholarships: 70%

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

Please see the program/department for more information.

Contact Information

AMDT Graduate Program
Apparel, Merchandising, Design and Textiles
PO Box 642020
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Telephone: 509-335-1233
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Faculty

Catherine Black, Linda Bradley, Ting Chi, Meriem Chida, Joan Ellis, Yoo Kwon, Karen Leonas and Carol Salusso.

Apparel, Merchandising, Design & Textiles

AMT

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702 Master's Special Problems, Directed Study and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Apparel, Merchandising, Design & Textiles

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512 Statistical Methods in Research II 3 (2-2) Prereq Stat 412 or equivalent. Analysis and interpretation of designed experiments: CRD, RCBD, spit-plot and repeated measures, multiple comparisons, multiple regression modeling, validation of assumptions.

Applied Economics

Degree offered: Master of Arts in Applied Economics

Faculty working with graduate students: 22

Graduate students: 17

Graduate students receiving assistantships or scholarships: 11%

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal), TOEFL

Deadline: Fall: January 10

Requirements

Final Oral ExaminationFor non-thesis option, must complete additional graded elective course

Program Description

The M.S. in Applied Economics program provides strong foundations in economic theory, quantitative methods, applications, communication skills, and research analysis. Students can focus their studies in general economics, agribusiness, or agricultural and resource economics by carefully selecting supporting and elective courses.

Degree Description

The M.S. in Applied Economics program provides strong foundations in economic theory, quantitative methods, applications, communication skills, and research analysis. Students can focus their studies in general economics, agribusiness, or agricultural and resource economics by carefully selecting supporting and elective courses. Students can earn an M.S. in Applied Economics to specifically prepare for positions in private corporations and government service as management specialists, policy analysts, forecasters or economic consultants. Two options are offered in the degree--thesis and non-thesis. This degree can be completed by well-prepared students in two years or less.

Training and Professional Development Opportunities

None

Post-Graduate Employment Opportunities

Management Specialists, Policy Analysts, Forecasters, Economic Consultants

Post-Graduate Career Placements

Statistician, USDA, Analyst for NTS Communications, Real Estate Economist, Dept of Housing and Urban Development

Contact Information

Dr. Hayley Chouinard
Associate Professor
School of Economic Sciences
PO Box 646210
Hulbert Hall 101
Pullman, WA 99164-6210
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Fax: 509-335-1173
E-mail: chouinard@wsu.edu

Faculty

Raymond Batina, Kenneth Casavant, Andrew Cassey, Seung Choi, Hayley Chouinard, Benjamin Cowan, Ana Espinola-Arredondo, Gregmar Galinato, Rosa Gallardo, Mark Gibson, Bidisha Mandal, Thomas Marsh, Jill McCluskey, Vicki McCracken, R Mittelhammer, Felix Munoz-Garcia, Joseph Neibergs, Robert Rosenman, C Shumway, Philip Wandschneider, Jia Yan and Jonathan Yoder.

ECONS

500 Macroeconomic Theory I 3 Prereq EconS 302; one year of calculus. Introduction to dynamics, growth and investment, overlapping generations models, Ramsey model, consumption and investment.

501 Microeconomic Theory I 3 Prereq EconS 301 or 305; one year calculus. Microeconomic theory, multivariate optimization, consumer and producer theory, competitive partial equilibrium, introduction to imperfect competition.

502 Macroeconomic Theory II 3 Prereq EconS 500. Macroeconomic theory, short-run fluctuations and nominal rigidities, monetary economics and inflation, real business cycle models, unemployment international macroeconomics.

503 Microeconomic Theory II 3 Prereq EconS 501. General equilibrium, welfare economics and social choice, market failure, game theory, economics of information.

504 Production and Consumption Economics 3 Prereq EconS 502; EconS 503. Advanced duality topics, demand and supply system modeling, financial economics and risk.

510 Statistics for Economists 3 Prereq college calculus and matrix algebra. Statistical theory underlying econometric techniques utilized in quantitative analysis of problems in economics and finance.

511 Econometrics I 3 Prereq EconS 510. Single equation linear and nonlinear models; estimation, inference, finite and asymptotic properties, effects and mitigation of violations of classical assumptions.

512 Econometrics II 3 Prereq EconS 501; EconS 511. Econometric methods for systems estimation; simultaneous equations, discrete and limited dependent variable, panel data, and time series data.

513 Econometrics III 3 Prereq EconS 502; EconS 503; EconS 512. Linear and non-linear models and maximum likelihood estimation and inference; semi-parametric and parametric methods; limited dependent variable models.

514 Econometrics IV 3 Prereq EconS 502; EconS 503; EconS 513. Constrained estimation, testing hypotheses, bootstrap resampling, BMM estimation and inference, nonparametric regression analysis, and an introduction to Bayesian econometrics.

521 Topics in Economic Sciences V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq EconS 301; EconS 302; EconS 311. Current topics in the development and application of the economic sciences.

525 Master's Econometrics 3 Prereq 3 hours in statistics. Theory and practice of multiple regression methods; applications to the study of economic and other phenomena; use of computer regression programs.

526 Master's Microeconomic Analysis 3 Prereq EconS 301 or 305; Math 171 or 202. Masters-level, calculus-based producer and consumer theory with selected managerial economics topics.

527 Mathematics for Economists 3 Prereq graduate standing. Mathematical methods applicable to economic analysis and research.

529 Research Methods V 1-2 May be repeated for credit; cumulative maximum 3 hours. Prereq graduate standing. Prepare and communicate professional-quality research with an emphasis on learning how to identify, develop, write, and present research.

531 Economic Analysis of Environmental Policies 3 Prereq EconS 301; EconS 311; EconS 330. Graduate-level counterpart of EconS 431; additional requirements. Credit not granted for both EconS 431 and 531.

532 Natural Resource Economics and Policy 3 Prereq EconS 301 or permission of instructor. Graduate-level counterpart of EconS 432; additional requirements. Credit not granted for both EconS 432 and 532.

533 International Trade and Policy 3 Prereq graduate standing. International trade theories, policies, and research issues related to world trade with emphasis on agricultural commodity markets.

534 Production Economics 3 Prereq EconS 526. Production economics theory and methods applied to problems of production response, economic optimization, technology, policy, risk and dynamics.

535 Applied Industrial Organization 3 Economic and strategic management theories and their relevance to agribusiness decision-making including empirical applications.

555 Managerial Economics for Decision Making 3 Prereq admission to MBA program. Optimal economic decision making for business in a global environment. Not open to economics graduate students.

571 International Trade 3 Prereq EconS 502; EconS 503; EconS 511. Recent developments in trade theory and policy, including international factor movements, empirical analysis of trade flows and strategic trade policies.

572 International Development 3 Prereq EconS 502; EconS 503; EconS 511. Structural and two-sector growth models of developing countries and countries in transition; empirical estimation of sources of growth.

581 Natural Resource Economics 3 Prereq EconS 502; EconS 503; EconS 511. Economic dynamics of natural resource systems.

582 Environmental Economics 3 Prereq EconS 502; EconS 503; EconS 511. Economic theory for environmental issues; externalities, property rights, and welfare analysis; policy design and implementation; non-market valuation and cost/benefit analysis.

583 Public Sector Economics 3 Prereq EconS 502; EconS 503; EconS 511. Public sector and public choice economics, including government debt and tax policy, public decision making, bureaucratic behavior and rent-seeking, with applications.

593 Applications in Microeconomic Topics 3 Prereq EconS 502, 503, 511. Applied topics in healthcare, sports, transportation and other markets.

594 Theory of Industrial Organization 3 Prereq EconS 502, 503, 511. Theory of market structure and firm behavior, including price and non-price competition, information and strategic behavior, and technological change.

596 Advanced Topics in Financial Economics V 1-6 May be repeated for credit; cumulative maximum 12 hours. Prereq EconS 500; EconS 501. Same as Fin 596.

598 PhD Research Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Prereq graduate standing. Seminar focusing on PhD students presenting their own research and critically assessing the research of other PhD students.

599 Special Topics in Economics 3 Prereq graduate standing.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

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E-mail: chouinard@wsu.edu

Faculty

Raymond Batina, Kenneth Casavant, Andrew Cassey, Seung Choi, Hayley Chouinard, Benjamin Cowan, Ana Espinola-Arredondo, Gregmar Galinato, Rosa Gallardo, Mark Gibson, Bidisha Mandal, Thomas Marsh, Jill McCluskey, Vicki McCracken, R Mittelhammer, Felix Munoz-Garcia, Joseph Neibergs, Robert Rosenman, C Shumway, Philip Wandschneider, Jia Yan and Jonathan Yoder.

ECONS

500 Macroeconomic Theory I 3 Prereq EconS 302; one year of calculus. Introduction to dynamics, growth and investment, overlapping generations models, Ramsey model, consumption and investment.

501 Microeconomic Theory I 3 Prereq EconS 301 or 305; one year calculus. Microeconomic theory, multivariate optimization, consumer and producer theory, competitive partial equilibrium, introduction to imperfect competition.

502 Macroeconomic Theory II 3 Prereq EconS 500. Macroeconomic theory, short-run fluctuations and nominal rigidities, monetary economics and inflation, real business cycle models, unemployment international macroeconomics.

503 Microeconomic Theory II 3 Prereq EconS 501. General equilibrium, welfare economics and social choice, market failure, game theory, economics of information.

504 Production and Consumption Economics 3 Prereq EconS 502; EconS 503. Advanced duality topics, demand and supply system modeling, financial economics and risk.

505 Economics for Agricultural Decision Making 3 Prereq admission to the MS in Agriculture. Managerial economics with specific applications to agricultural issues.

510 Statistics for Economists 3 Prereq college calculus and matrix algebra. Statistical theory underlying econometric techniques utilized in quantitative analysis of problems in economics and finance.

511 Econometrics I 3 Prereq EconS 510. Single equation linear and nonlinear models; estimation, inference, finite and asymptotic properties, effects and mitigation of violations of classical assumptions.

512 Econometrics II 3 Prereq EconS 501; EconS 511. Econometric methods for systems estimation; simultaneous equations, discrete and limited dependent variable, panel data, and time series data.

513 Econometrics III 3 Prereq EconS 502; EconS 503; EconS 512. Linear and non-linear models and maximum likelihood estimation and inference; semi-parametric and parametric methods; limited dependent variable models.

514 Econometrics IV 3 Prereq EconS 502; EconS 503; EconS 513. Constrained estimation, testing hypotheses, bootstrap resampling, BMM estimation and inference, nonparametric regression analysis, and an introduction to Bayesian econometrics.

521 Topics in Economic Sciences V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq EconS 301; EconS 302; EconS 311. Current topics in the development and application of the economic sciences.

525 Master's Econometrics 3 Prereq 3 hours in statistics. Theory and practice of multiple regression methods; applications to the study of economic and other phenomena; use of computer regression programs.

526 Master's Microeconomic Analysis 3 Prereq EconS 301 or 305; Math 171 or 202. Masters-level, calculus-based producer and consumer theory with selected managerial economics topics.

527 Mathematics for Economists 3 Prereq graduate standing. Mathematical methods applicable to economic analysis and research.

529 Research Methods V 1-2 May be repeated for credit; cumulative maximum 3 hours. Prereq graduate standing. Prepare and communicate professional-quality research with an emphasis on learning how to identify, develop, write, and present research.

531 Economic Analysis of Environmental Policies 3 Prereq EconS 301; EconS 311; EconS 330. Graduate-level counterpart of EconS 431; additional requirements. Credit not granted for both EconS 431 and 531.

532 Natural Resource Economics and Policy 3 Prereq EconS 301 or permission of instructor. Graduate-level counterpart of EconS 432; additional requirements. Credit not granted for both EconS 432 and 532.

533 International Trade and Policy 3 Prereq graduate standing. International trade theories, policies, and research issues related to world trade with emphasis on agricultural commodity markets.

534 Production Economics 3 Prereq EconS 526. Production economics theory and methods applied to problems of production response, economic optimization, technology, policy, risk and dynamics.

535 Applied Industrial Organization 3 Economic and strategic management theories and their relevance to agribusiness decision-making including empirical applications.

555 Managerial Economics for Decision Making 3 Prereq admission to MBA program. Optimal economic decision making for business in a global environment. Not open to economics graduate students.

571 International Trade 3 Prereq EconS 502; EconS 503; EconS 511. Recent developments in trade theory and policy, including international factor movements, empirical analysis of trade flows and strategic trade policies.

572 International Development 3 Prereq EconS 502; EconS 503; EconS 511. Structural and two-sector growth models of developing countries and countries in transition; empirical estimation of sources of growth.

581 Natural Resource Economics 3 Prereq EconS 502; EconS 503; EconS 511. Economic dynamics of natural resource systems.

582 Environmental Economics 3 Prereq EconS 502; EconS 503; EconS 511. Economic theory for environmental issues; externalities, property rights, and welfare analysis; policy design and implementation; non-market valuation and cost/benefit analysis.

583 Public Sector Economics 3 Prereq EconS 502; EconS 503; EconS 511. Public sector and public choice economics, including government debt and tax policy, public decision making, bureaucratic behavior and rent-seeking, with applications.

593 Applications in Microeconomic Topics 3 Prereq EconS 502, 503, 511. Applied topics in healthcare, sports, transportation and other markets.

594 Theory of Industrial Organization 3 Prereq EconS 502, 503, 511. Theory of market structure and firm behavior, including price and non-price competition, information and strategic behavior, and technological change.

596 Advanced Topics in Financial Economics V 1-6 May be repeated for credit; cumulative maximum 12 hours. Prereq EconS 500; EconS 501. Same as Fin 596.

598 PhD Research Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Prereq graduate standing. Seminar focusing on PhD students presenting their own research and critically assessing the research of other PhD students.

599 Special Topics in Economics 3 Prereq graduate standing.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Architecture

Degree offered: Master of Architecture

Faculty working with graduate students: 16

Graduate students: 67

Graduate students receiving assistantships or scholarships: 25%

Program offered: Pullman, Spokane

Tests required: TOEFL, TOEFLI

Deadline: :
Fall: January 10

Requirements

Monograph and public presentation of graduate project. Summer internship/ travel/ independent study.

Program Description

The School offers as its professional degree in Architecture the Master of Architecture. This degree is the professional degree accredited by the National Architectural Accrediting Board (NAAB) which allows students to take state exams and become licensed architects. Students must successfully complete a four-year undergraduate degree in architecture or a previous five-year Bachelor of Architecture degree to be eligible for the Master of Architecture program. Students with Baccalaureate degrees in disciplines other than architecture are eligible to apply for the 3.5 year Master of Architecture program. Please consult the WSU Graduate Catalog and/or www.arch.wsu.edu for specific information regarding this degree as well as admission requirements and course descriptions.The architecture curriculum is planned so that foreign study and other off-campus programs can be incorporated. Foreign studies options include WSU sponsored programs, and programs offered by other institutions. Coordination is through the WSU Education Abroad Office.

Degree Description

M.Arch students engage studio, site design, technology, history and theory. The culmination of graduate study is a two semester studio project. It is expected the project be based on a defined hypothesis and demonstrate a comprehensive understanding and solution to a particular architectural issue. There are three tracks for completing the M.Arch. Track 1 is 1 Â½ years for those with B.S. in Architectural Studies from WSU or a professional accredited degree (B.Arch) from a university in the U.S. Track 2 is 2 Â½ years for those with a four year pre-professional architecture degree from a U.S. university or equivalent. Track 2 is also for students who need additional courses or studio work. Track 3 is 3 Â½ years for those with a non-architecture undergraduate degree. Determination for admission is based upon skills demonstrated through the portfolio. The M.Ach is offered at both the Pullman (typically Track 1 and 3) and Spokane (typically Track 2) campuses.

Training and Professional Development Opportunities

Internship; study abroad.

Post-Graduate Employment Opportunities

Employment in the architecture profession as a licensed architect and/or employment options in fields related to architecture

Post-Graduate Career Placements

ALSC Archiects; Callison; NBBJ; NAC; Madsen Mitchell; Clark Kjos Architects; Integrus; MulvannyG2; LRS Architects; OMS; Jon Graves Architects and Planners; Copeland Architects; John Lape; BWA Spokane; Nystrom, Olson, Collins; HKP Architects; KDF Architecture; Erickson McGovern; University of Washington Capital Planning; City of Spokane.

Contact Information

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Faculty

John Abell, Robert Barnstone, Todd Beyreuther, Matthew Cohen, Jason Gruen, David Gunderson, Thomas Heustis, Paul Hirzel, Bashir Kazimee, Gregory Kessler, William Kirk, Taiji Miyasaka, Anna Mutin, Jason Peschel, Ayad Rahmani and David Wang.

ARCH

510 Architectural Design Studio 6 (0-12) Graduate studio experience researching a single topic of architectural relevance (i.e. geology, material science, biological systems engineering). Field trip required.

511 Design VIII/Graduate Design Project 6 (0-12) Prereq Arch 403. Studio course divided between urban design and preliminary design on graduate project.

513 Graduate Design Project 6 (0-12) Prereq Arch 511, 515. Final graduate design studio focusing on individualized topics.

520 Directed Topics in Architecture V 1-3 May be repeated for credit; cumulative maximum 6 hours. Topics related to areas of emphasis in the program and student specialization.

525 History and Theory 3 Prereq graduate standing; Arch 409. History and theory of 20th century architecture focusing on cultural and philosophical principles related to design.

527 Site and Landscape Design 3 Prereq graduate standing; Arch 403. Exploration of issues of site context analysis, topography, planning, and landscape design.

530 Philosophies and Theories of the Built Environment 3 Prereq graduate standing in Arch/I D/L A. Focus on systematic thought which may describe behavior of the built environment.

531 Advanced Tectonics 3 Prereq graduate standing; Arch 330; Arch 403. Tectonic theory of concrete and metal construction with focus on skin design and technology as formative elements in architecture.

540 Research Methods 3 Prereq graduate standing. Research methods, from quantitative to technical to philosophical, directed toward qualitative research.

542 Issues in Architecture 3 Prereq graduate standing; Arch 409, 525. Examination of issues in architecture related to society, culture, environment, politics, and philosophy.

560 Interdisciplinary Seminar 3 Prereq graduate standing. Explores approaches to design thinking in the topic areas of people and place, history, theory and criticism, and physical design.

563 Architectural Structures III 3 Prereq Arch 515 or c//. Graduate-level counterpart of Arch 463; additional requirements. Credit not granted for both Arch 463 and 563.

570 Advanced Architectural Studio/Laboratory 6 (0-12) In-depth study of design problems relating to cultural, environmental, technological and other issues as related to the studentâ™s area of emphasis.

571 Advanced Architectural Studio II 6 (0-12) Prereq Arch 570; graduate standing. Drawing from architectural historical and theoretical research, urban architectural design case study, research in the arts, humanities and social sciences.

573 Ethics and Practice 3 Prereq graduate standing. Ethical and professional practice issues related to the business and practice of architecture; investigations into marketing client and business orientation.

577 Theories and Methods of Urban Construction 3 Prereq graduate standing or certified Arch major with senior standing. Morphology, theoretical concepts, planning and spatial structure of cities and analysis of the transformation of the city core in Europe and America.

580 Architecture Internship V 1-4 May be repeated for credit. Prereq graduate student in M Arch degree program. Placement in an approved industrial, professional, or governmental situation for specialized or general experience.

702 Master's Special Problems, Directed Study, and/or Examination V 1-6 May be repeated for credit.

Bioethics - Cert in Bioethics

Degree offered: Graduate Certificate in Bioethics

Requirements

Please see the program/department for more information.

Biological and Agricultural Engineering

Degree offered: Doctor of Philosophy (Biological and Agricultural Engineering)

Faculty working with graduate students: 16

Graduate students: 53

Graduate students receiving assistantships or scholarships: 84%

Tests required: TOEFL, TOEFLI, IELTS

Deadline: Fall: January 10
Spring: July 1

Requirements

Two articles, based on doctoral research, must be submitted to a peer reviewed journal.Must present a minimum of two seminars. The first is a brief 25-minute seminar based on the student doctoral research proposal. The second is a 50-minute seminar prior to the final examination.

Program Description

Biological and Agricultural Engineering is a multidisciplinary program that offers students flexibility to accommodate a blend of engineering and science in their programs of study and research projects. Students apply engineering and biological principles to conduct high-quality research and to develop and disseminate knowledge and technologies in the areas of agriculture, food, energy, and natural resource systems. The Department offers Ph.D. and M.S. degrees in Biological and Agricultural Engineering, Ph.D. in Engineering Science, and M.S. in Engineering with four areas of emphasis: a) Food Engineering, b) Bioenergy and Bioproduct Engineering, c) Land, Air, Water Resources and Environmental Engineering, and d) Agricultural Automation Engineering.

Degree Description

The department offers the PhD degree with four research areas of emphasis: Bioenergy and Bioproducts Engineering; Food Engineering; Land, Air, Water Resources and Environmental Engineering; and Agricultural Automation Engineering.

Contact Information

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Faculty

Gustavo Barbosa-Canovas, Shulin Chen, Craig Frear, Manuel Garcia-Perez, Gerrit Hoogenboom, Manoj Karkee, Hanwu Lei, Pius Ndegwa, R Peters, Shyam Sablani, Claudio Stockle, Juming Tang, Jeffrey Ullman, Joan Wu, Bin Yang and Qin Zhang.

BSYSE

512 Research and Teaching Methods 3 (2-3) Graduate research with an emphasis on biological systems engineering and college instruction.

530 Machine Vision for Biological Systems 3 Image analysis techniques as applied to machine vision applications integrated into autonomous equipment used in specialty crops.

532 Electrohydraulic Systems Control 3 Fluid power transmission, E/H control, control systems and controller design.

541 Instrumentation and Measurements 3 (2-3) Prereq Math 172; Phys 102 or 202. Instrumentation systems and measurement concepts, electronic signal-conditioning components and circuitry, digital electronics and microprocessor basics.

550 Soil and Water Conservation Engineering 3 Land, water and air conservation emphasizing on soil and water engineering concepts, state of science solution techniques, and engineering design.

551 Advanced Biological Systems Engineering Topics V 1-4 May be repeated for credit; cumulative maximum 6 hours. Directed group study of selected advanced topics in biological systems engineering.

552 Advanced Biological Systems Engineering Topics V 1-4 May be repeated for credit. Directed group study of selected advanced topics in biological systems engineering.

554 Aquatic System Restoration 3 Prereq Chem 345, C E 583; MBioS 101, C E 581. Same as C E 585.

555 Natural Systems for Wastewater Treatment 3 Same as C E 555.

556 Surface Hydrologic Processes and Modeling 3 (2-3) Fundamental hydrologic processes, governing equations and solution methods, GIS techniques commonly used in hydrology, class project on modeling surface hydrology.

557 Nutrient Cycling and Transport 3 Cycling of carbon, nitrogen and phosphorus at global and watershed scales; modeling of transportation and transport in agricultural systems

558 Groundwater Flow and Contaminant Transport 4 (3-3) Prereq Math 315; BsysE 351 or C E 351 or Geol 475. Physics of flow and contaminant transport in saturated porous media including governing equations, well hydraulics and computer modeling.

560 Aquatic Chemistry 3 Prereq C E 518. Same as C E 583.

564 Agricultural Waste and Air Quality Management 3 Detailed analyses of agricultural wastes and their potential adverse impacts on the environment; current management systems; reuse and recycle.

581 Advanced Physical Properties of Foods 3 Prereq BSysE 481, Math 315. Analysis, modeling, and experimental procedures to measure food physical properties for use in food processing system design.

582 Food Process Engineering I 3 Prereq BSysE 481 or Ch E 330. Design of food processing systems; design and simulation of sterilization and pasteurization processes in foods.

583 Food Process Engineering II 3 Prereq BSysE 582. Design of food separation unit operations including concentration, dehydration, and membrane processes.

584 Thermal and Nonthermal Processing of Foods 3 Food preservation methods based on application of thermal and nonthermal processes.

585 Food Packaging 3 Properties of packaging materials, manufacturing of packages, shelf-life testing and food packaging interaction.

594 Design and Analysis of Biomass Conversion Processes and Systems 3 Analysis of bioprocessing and biotreatment processes including energenetics, stoichiometry, species competition, process infiltration, product separation and optimization.

595 Biosystems Engineering for Fuel and Chemicals 3 Design and optimization of biological systems for industrial functions, modeling and simulation of cell processes, bioreactors and system integration.

596 Biomass Thermo-Chemical Conversion 3 Biomass chemistry, analytical thermo-chemistry, torrefaction, pyrolysis, gasification and combustion; characterization and uses of themochemcial products.

598 Graduate Seminar 1 May be repeated for credit. Required of all graduate students in biological systems engineering.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit. (For PhD in engineering science only.)

Biological and Agricultural Engineering

Degree offered: Master of Science in Biological and Agricultural Engineering

Faculty working with graduate students: 16

Graduate students: 12

Graduate students receiving assistantships or scholarships: 58%

Tests required: IELTS, TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

A written research proposal must be completed by the end of the third semester.

Program Description

Biological and Agricultural Engineering is a multidisciplinary program that offers students flexibility to accommodate a blend of engineering and science in their programs of study and research projects. Students apply engineering and biological principles to conduct high-quality research and to develop and disseminate knowledge and technologies in the areas of agriculture, food, energy, and natural resource systems. The Department offers Ph.D. and M.S. degrees in Biological and Agricultural Engineering, Ph.D. in Engineering Science, and M.S. in Engineering with four areas of emphasis: a) Food Engineering, b) Bioenergy and Bioproduct Engineering, c) Land, Air, Water Resources and Environmental Engineering, and d) Agricultural Automation Engineering.

Degree Description

The department of Biological Systems Engineering integrates the biological sciences and engineering for the development of engineering solutions to agricultural, food and natural systems.

Contact Information

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Faculty

Gustavo Barbosa-Canovas, Shulin Chen, Craig Frear, Manuel Garcia-Perez, Gerrit Hoogenboom, Manoj Karkee, Hanwu Lei, Pius Ndegwa, R Peters, Shyam Sablani, Claudio Stockle, Juming Tang, Jeffrey Ullman, Joan Wu, Bin Yang and Qin Zhang.

BSYSE

512 Research and Teaching Methods 3 (2-3) Graduate research with an emphasis on biological systems engineering and college instruction.

530 Machine Vision for Biological Systems 3 Image analysis techniques as applied to machine vision applications integrated into autonomous equipment used in specialty crops.

532 Electrohydraulic Systems Control 3 Fluid power transmission, E/H control, control systems and controller design.

541 Instrumentation and Measurements 3 (2-3) Prereq Math 172; Phys 102 or 202. Instrumentation systems and measurement concepts, electronic signal-conditioning components and circuitry, digital electronics and microprocessor basics.

550 Soil and Water Conservation Engineering 3 Land, water and air conservation emphasizing on soil and water engineering concepts, state of science solution techniques, and engineering design.

551 Advanced Biological Systems Engineering Topics V 1-4 May be repeated for credit; cumulative maximum 6 hours. Directed group study of selected advanced topics in biological systems engineering.

552 Advanced Biological Systems Engineering Topics V 1-4 May be repeated for credit. Directed group study of selected advanced topics in biological systems engineering.

554 Aquatic System Restoration 3 Prereq Chem 345, C E 583; MBioS 101, C E 581. Same as C E 585.

555 Natural Systems for Wastewater Treatment 3 Same as C E 555.

556 Surface Hydrologic Processes and Modeling 3 (2-3) Fundamental hydrologic processes, governing equations and solution methods, GIS techniques commonly used in hydrology, class project on modeling surface hydrology.

557 Nutrient Cycling and Transport 3 Cycling of carbon, nitrogen and phosphorus at global and watershed scales; modeling of transportation and transport in agricultural systems

558 Groundwater Flow and Contaminant Transport 4 (3-3) Prereq Math 315; BsysE 351 or C E 351 or Geol 475. Physics of flow and contaminant transport in saturated porous media including governing equations, well hydraulics and computer modeling.

560 Aquatic Chemistry 3 Prereq C E 518. Same as C E 583.

564 Agricultural Waste and Air Quality Management 3 Detailed analyses of agricultural wastes and their potential adverse impacts on the environment; current management systems; reuse and recycle.

581 Advanced Physical Properties of Foods 3 Prereq BSysE 481, Math 315. Analysis, modeling, and experimental procedures to measure food physical properties for use in food processing system design.

582 Food Process Engineering I 3 Prereq BSysE 481 or Ch E 330. Design of food processing systems; design and simulation of sterilization and pasteurization processes in foods.

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596 Biomass Thermo-Chemical Conversion 3 Biomass chemistry, analytical thermo-chemistry, torrefaction, pyrolysis, gasification and combustion; characterization and uses of themochemcial products.

598 Graduate Seminar 1 May be repeated for credit. Required of all graduate students in biological systems engineering.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

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Biological and Agricultural Engineering

Degree offered: Master of Science in Biological and Agricultural Engineering - Non Thesis

Faculty working with graduate students: 16

Tests required: IELTS, TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Program Description

Biological and Agricultural Engineering is a multidisciplinary program that offers students flexibility to accommodate a blend of engineering and science in their programs of study and research projects. Students apply engineering and biological principles to conduct high-quality research and to develop and disseminate knowledge and technologies in the areas of agriculture, food, energy, and natural resource systems. The Department offers Ph.D. and M.S. degrees in Biological and Agricultural Engineering, Ph.D. in Engineering Science, and M.S. in Engineering with four areas of emphasis: a) Food Engineering, b) Bioenergy and Bioproduct Engineering, c) Land, Air, Water Resources and Environmental Engineering, and d) Agricultural Automation Engineering.

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Training and Professional Development Opportunities

N/A

Contact Information

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598 Graduate Seminar 1 May be repeated for credit. Required of all graduate students in biological systems engineering.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit. (For PhD in engineering science only.)

Biology

Degree offered: Master of Science in Biology - Non Thesis

Faculty working with graduate students: 33

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: September 1

Requirements

12 credits of Biol 500 level prefix courses1 credit of Biol 589 seminar

Program Description

This degree is generally meant for students who wish to pursue careers in education that require graduate degrees but not research experience. Thus, this degree does not require a research thesis.

Degree Description

The plan for the non-thesis MS in Biology is all coursework related. A minimum of 26 graded credits is required.

Contact Information

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BIOL

500 **Seminar** 1 May be repeated for credit. Prereq 20 hours Biol.

504 **Experimental Methods in Plant Physiology** 3 (2-3) Advanced techniques and instrumental methods applicable to research in plant physiology.

509 **Plant Anatomy** 4 (2-6) Graduate-level counterpart of Biol 409; additional requirements. Credit not granted for both Biol 409 and 509.

511 **Reproductive Biology of Fishes** 2 Prereq graduate standing. Covering all aspects of the reproductive biology of fishes. The class will meet once per week for 2 hours; the first hour will be used for a formal lecture, the second hour will be used for informal student presentations/discussion of current literature topics or assigned readings in the field. (Spring only, Alt/yrs).

512 **Molecular Mechanisms of Plant Development** 3 Prereq Biol 320. Physiology of growth; metabolism during development and reproduction.

513 **Plant Metabolism** 3 Prereq Biol 320, MBioS 303. Metabolic processes unique to plants, including the primary incorporation of nitrogen, sulfur, carbon dioxide and phosphate into bio-molecules.

514 **Fish Genetics** 2 Prereq Biol 301. Chromosomal, biochemical, quantitative, and ecological aspects of fish genetics with emphasis on applications to aquaculture and fish management.

515 **Fish Physiology** 2 Prereq Fish 511 and permission. Principles and methods used to study vital organs, organ systems, growth, and reproduction of fishes; emphasis on osmoregulation, metabolism, endocrinology, and respiration.

517 **Stress Physiology of Plants** 3 Prereq graduate standing. Temperature, light, salinity, water effects on physiological processes; mechanistic understanding of stress.

519 **Introduction to Population Genetics** 3 Prereq Biol 301. Survey of basic population and quantitative genetics.

520 **Conservation Genetics** 2 Prereq Biol 301. Genetic studies and approaches relevant to efforts to conserve threatened and endangered populations of organisms.

521 **Quantitative Genetics** 3 Prereq Biol 519 or permission of instructor. Fundamentals of quantitative genetics; evolutionary quantitative genetics.

523 **Advanced Fishery Management** 3 Contemporary management of marine and freshwater fish and shellfish populations of the world. Approaches, factors, and models used to manage commercial, recreational and subsistence fisheries; and the policy interface of biological systems with governmental and social institutions. (Spring, Alt/yrs).

531 **Principles of Systematic Biology** 3 Prereq graduate standing. Systematic theory; history and current views; approaches to phylogenetic analysis and classification.

533 **Modern Methods in Systematics** 4 (2-6) Selecting, gathering, and analyzing morphological, cytological, molecular data for phylogenetic and evolutionary studies.

537 **Plant Cell Biology** 3 Prereq graduate standing. Structure and function of plant cells including membrane biology, protein targeting and molecular signaling with emphasis on current research.

540 **Stable Isotope Theory and Methods** 3 (2-3) Prereq graduate standing. Theory and practice of measuring stable isotope ratios of biologically important elements; training in the use of isotope mass spectrometers.

544 **Nitrogen Cycling in the Earth's Systems** 3 Prereq graduate standing. Nitrogen dynamics in terrestrial, aquatic, and atmospheric systems; nitrogen transformations in natural and managed systems and responses to human activities.

548 **Evolutionary Ecology of Populations** 3 Evolutionary dynamics of natural populations and the co-evolution of species.

556 **Biochemical Adaptation** 3 Prereq graduate standing. Relationships between enzyme/macromolecule adaptation and animal performance.

559 **Hormones, Brain and Behavior** 3 Prereq upper-division biology, psychology or anthropology course. Classical behavioral endocrinology from molecular to whole organisms, integrating evolutionary ecology, neuroethology and behavioral neuroendocrinology.

560 **Plant Ecophysiology** 3 Prereq graduate standing. Relationships of biotic and abiotic environment to plant distribution and evolution through study of physiological processes.

561 **Environmental Physiology** 3 Prereq graduate standing. Individual and evolutionary adaptations to changing environments with emphasis on recent literature.

563 **Field Ecology** 2 (0-6) Prereq Biol 562. Field implementation of descriptive and experimental techniques to quantify the structure, composition, and interactions within natural communities. Field trips required.

564 **Molecular Ecology and Phylogeography** 3 Prereq Biol 301 or equivalent; Biol 405 or equivalent. Use of genetic markers for the study of ecological phenomena, including kinship, population structure, and phylogeography.

566 **Mathematical Genetics** 3 Prereq graduate standing. Same as Math 563.

567 **Ecological Restoration** 3 Prereq graduate standing or by permission. Introduction to major issues in restoration ecology; major ecological dimensions of restoration.

568 **Conservation Ecology** 3 Prereq Graduate standing. Diagnosis of endangered species, population viability analysis, invasive species ecology, landscape ecology and ecosystem management.

569 **Ecosystem Ecology and Global Change** 3 Prereq graduate standing. Graduate-level counterpart of Biol 469; additional requirements. Credit not granted for both Biol 469 and 569.

570 **Diversity of Plants** 3 Prereq graduate standing. Morphological, life history, and ecological diversity of major plant clades; emphasis on principles of homology, character transformation, and macroevolution.

581 **Comparative Biology of Social Traditions** 3 Prereq Anth 260 or Biol 106; senior or graduate standing. Same as Anth 581.

582 **Professional Communication in Biology** 2 Prereq graduate standing. Mechanics and style of publishing biological findings; adaptation of writing to various venues and audiences.

589 Advanced Topics in Biology V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent advances in biology.

591 Seminar in Molecular Plant Sciences 1 May be repeated for credit. Same as MPS 515.

593 Seminar I 1 May be repeated for credit. Literature and problems.

597 Teaching Practicum V 1-4 May be repeated for credit; cumulative maximum 4 hours. Zoology laboratory teaching internship.

598 IPEM Seminar 1 May be repeated for credit; cumulative maximum 6 hours. Prereq IGERT fellow. Same as Anth 596.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Biotechnology Management - Cert in Biotech Management

Degree offered: Graduate Certificate in Biotechnology Management

Requirements

Please see the program/department for more information.

Botany

Degree offered: Doctor of Philosophy (Botany)

Faculty working with graduate students: 16

Graduate students: 20

Graduate students receiving assistantships or scholarships: 100%

Tests required: GRE (Combined), TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: September 1

Requirements

Proposal defense; Exit seminar

Program Description

The School of Biological Sciences offers a rigorous and competitive degree in Botany. Students who complete this degree are successful in a broad variety of careers, including those in: research universities, teaching colleges, federal and state government and the private sector.

Degree Description

Our botany students generally focus on research in the broad areas of plant physiology, ecology, evolution, systematics, and molecular biology.

Training and Professional Development Opportunities

Our program offers teaching training and grant writing courses. Other professional development opportunities include weekly reading groups, ecolunch meetings, a graduate student research symposium and frequent graduate seminars.

Post-Graduate Employment Opportunities

Most students continue into postdoctoral research positions. Other students pursue careers at community colleges or in Federal or State governments.

Post-Graduate Career Placements

Recent graduates have obtained faculty positions at: Cornell University, University of California- Bakersfield, University of Arizona, Purdue University, and Eastern Washington University. Others hold jobs with: US Forest Service, USDA, Battelle Pacific Northwest Laboratories, the Marine Selby Botanical Gardens and the Florida Museum of Natural History.

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ANTH

547 Models and Simulation 3 Models and model-building as an anthropological approach to present and past cultures.

BIOL

500 Seminar 1 May be repeated for credit. Prereq 20 hours Biol.

501 Proposal Defense Seminar 2 Research proposal defense as part of the preliminary examination for candidacy in the Ph.D. program.

504 Experimental Methods in Plant Physiology 3 (2-3) Advanced techniques and instrumental methods applicable to research in plant physiology.

509 Plant Anatomy 4 (2-6) Graduate-level counterpart of Biol 409; additional requirements. Credit not granted for both Biol 409 and 509.

511 Reproductive Biology of Fishes 2 Prereq graduate standing. Covering all aspects of the reproductive biology of fishes. The class will meet once per week for 2 hours; the first hour will be used for a formal lecture, the second hour will be used for informal student presentations/discussion of current literature topics or assigned readings in the field. (Spring only, Alt/yrs).

512 Molecular Mechanisms of Plant Development 3 Prereq Biol 320. Physiology of growth; metabolism during development and reproduction.

513 Plant Metabolism 3 Prereq Biol 320, MBioS 303. Metabolic processes unique to plants, including the primary incorporation of nitrogen, sulfur, carbon dioxide and phosphate into bio-molecules.

514 Fish Genetics 2 Prereq Biol 301. Chromosomal, biochemical, quantitative, and ecological aspects of fish genetics with emphasis on applications to aquaculture and fish management.

515 Fish Physiology 2 Prereq Fish 511 and permission. Principles and methods used to study vital organs, organ systems, growth, and reproduction of fishes; emphasis on osmoregulation, metabolism, endocrinology, and respiration.

517 Stress Physiology of Plants 3 Prereq graduate standing. Temperature, light, salinity, water effects on physiological processes; mechanistic understanding of stress.

519 Introduction to Population Genetics 3 Prereq Biol 301. Survey of basic population and quantitative genetics.

520 Conservation Genetics 2 Prereq Biol 301. Genetic studies and approaches relevant to efforts to conserve threatened and endangered populations of organisms.

521 Quantitative Genetics 3 Prereq Biol 519 or permission of instructor. Fundamentals of quantitative genetics; evolutionary quantitative genetics.

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548 Evolutionary Ecology of Populations 3 Evolutionary dynamics of natural populations and the co-evolution of species.

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560 Plant Ecophysiology 3 Prereq graduate standing. Relationships of biotic and abiotic environment to plant distribution and evolution through study of physiological processes.

561 Environmental Physiology 3 Prereq graduate standing. Individual and evolutionary adaptations to changing environments with emphasis on recent literature.

563 Field Ecology 2 (0-6) Prereq Biol 562. Field implementation of descriptive and experimental techniques to quantify the structure, composition, and interactions within natural communities. Field trips required.

564 Molecular Ecology and Phylogeography 3 Prereq Biol 301 or equivalent; Biol 405 or equivalent. Use of genetic markers for the study of ecological phenomena, including kinship, population structure, and phylogeography.

566 Mathematical Genetics 3 Prereq graduate standing. Same as Math 563.

567 Ecological Restoration 3 Prereq graduate standing or by permission. Introduction to major issues in restoration ecology; major ecological dimensions of restoration.

568 Conservation Ecology 3 Prereq Graduate standing. Diagnosis of endangered species, population viability analysis, invasive species ecology, landscape ecology and ecosystem management.

569 Ecosystem Ecology and Global Change 3 Prereq graduate standing. Graduate-level counterpart of Biol 469; additional requirements. Credit not granted for both Biol 469 and 569.

570 Diversity of Plants 3 Prereq graduate standing. Morphological, life history, and ecological diversity of major plant clades; emphasis on principles of homology, character transformation, and macroevolution.

581 Comparative Biology of Social Traditions 3 Prereq Anth 260 or Biol 106; senior or graduate standing. Same as Anth 581.

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589 Advanced Topics in Biology V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent advances in biology.

591 Seminar in Molecular Plant Sciences 1 May be repeated for credit. Same as MPS 515.

593 Seminar I 1 May be repeated for credit. Literature and problems.

597 Teaching Practicum V 1-4 May be repeated for credit; cumulative maximum 4 hours. Zoology laboratory teaching internship.

598 IPEM Seminar 1 May be repeated for credit; cumulative maximum 6 hours. Prereq IGERT fellow. Same as Anth 596.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

E MIC

586 Special Projects in Electron Microscopy V 2 (0-6) to 3 (0-9) May be repeated for credit. Practical training in one or more areas of electron microscopy; TEM, SEM, ultramicrotomy, specimen processing; confocal flourescent microscopy.

587 Special Topics in Electron Microscopy 1 May be repeated for credit; cumulative maximum 4 hours.

Molecular Plant Sciences

MPS

515 Seminar in Molecular Plant Sciences 1 May be repeated for credit; cumulative maximum 4 hours. A cross-discipline seminar, including botany, crop and soils sciences, horticulture, plant pathology, and molecular plant sciences.

561 Biochemical Signaling 3 Prereq MBioS 513. Same as MBioS 561.

570 Advanced Topics in Molecular Plant Sciences 1 May be repeated for credit; cumulative maximum 3 hours. Oral presentation of a current research paper.

571 Research Proposal 2 May be repeated for credit; cumulative maximum 4 hours. Written and oral presentation of an area of molecular plant sciences.

587 Advanced Topics in Plant Biochemistry 3 Prereq MBioS 514; introductory botany. Same as MBioS 571.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Masterâ™s Research, Dissertation and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Natural Resource Sciences

NATRS

519 Advanced Topics V 1-3 May be repeated for credit; cumulative maximum 6 hours.

Natural Resource Sciences

SOILS

514 Environmental Biophysics 2 Prereq Math 107. Graduate-level counterpart of SoilS 414; additional requirements. Credit not granted for both SoilS 414 and 514.

515 Environmental Biophysics Laboratory 1 (0-3) Prereq SoilS 414 or c//. Graduate-level counterpart of SoilS 415; additional requirements. Credit not granted for both SoilS 415 and 515.

Natural Resource Sciences

STAT

512 Statistical Methods in Research II 3 (2-2) Prereq Stat 412 or equivalent. Analysis and interpretation of designed experiments: CRD, RCBD, spit-plot and repeated measures, multiple comparisons, multiple regression modeling, validation of assumptions.

530 Applied Linear Models 3 (2-2) Prereq Stat 360 or 412. The design and analysis of experiments by linear models.

Botany

Degree offered: Master of Science in Botany

Faculty working with graduate students: 16

Graduate students: 6

Graduate students receiving assistantships or scholarships: 100%

Tests required: GRE (Combined), TOEFL, TOEFLI

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Requirements

Exit seminar

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The School of Biological Sciences offers a rigorous and competitive degree in Botany. Students who complete this degree are successful in a broad variety of careers, including those in: research universities, teaching colleges, federal and state government and the private sector.

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Contact Information

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561 Environmental Physiology 3 Prereq graduate standing. Individual and evolutionary adaptations to changing environments with emphasis on recent literature.

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566 Mathematical Genetics 3 Prereq graduate standing. Same as Math 563.

567 Ecological Restoration 3 Prereq graduate standing or by permission. Introduction to major issues in restoration ecology; major ecological dimensions of restoration.

568 Conservation Ecology 3 Prereq Graduate standing. Diagnosis of endangered species, population viability analysis, invasive species ecology, landscape ecology and ecosystem management.

569 Ecosystem Ecology and Global Change 3 Prereq graduate standing. Graduate-level counterpart of Biol 469; additional requirements. Credit not granted for both Biol 469 and 569.

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582 Professional Communication in Biology 2 Prereq graduate standing. Mechanics and style of publishing biological findings; adaptation of writing to various venues and audiences.

589 Advanced Topics in Biology V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent advances in biology.

591 Seminar in Molecular Plant Sciences 1 May be repeated for credit. Same as MPS 515.

593 Seminar I 1 May be repeated for credit. Literature and problems.

597 Teaching Practicum V 1-4 May be repeated for credit; cumulative maximum 4 hours. Zoology laboratory teaching internship.

598 IPEM Seminar 1 May be repeated for credit; cumulative maximum 6 hours. Prereq IGERT fellow. Same as Anth 596.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

E MIC

586 Special Projects in Electron Microscopy V 2 (0-6) to 3 (0-9) May be repeated for credit. Practical training in one or more areas of electron microscopy; TEM, SEM, ultramicrotomy, specimen processing; confocal flourescent microscopy.

587 Special Topics in Electron Microscopy 1 May be repeated for credit; cumulative maximum 4 hours.

Natural Resource Sciences

NATRS

519 Advanced Topics V 1-3 May be repeated for credit; cumulative maximum 6 hours.

Natural Resource Sciences

SOILS

514 Environmental Biophysics 2 Prereq Math 107. Graduate-level counterpart of SoilS 414; additional requirements. Credit not granted for both SoilS 414 and 514.

515 Environmental Biophysics Laboratory 1 (0-3) Prereq SoilS 414 or c//. Graduate-level counterpart of SoilS 415; additional requirements. Credit not granted for both SoilS 415 and 515.

Natural Resource Sciences

STAT

512 Statistical Methods in Research II 3 (2-2) Prereq Stat 412 or equivalent. Analysis and interpretation of designed experiments: CRD, RCBD, spit-plot and repeated measures, multiple comparisons, multiple regression modeling, validation of assumptions.

Business Administration - Accounting

Degree offered: Doctor of Philosophy

Faculty working with graduate students: 5

Graduate students: 9

Graduate students receiving assistantships or scholarships: 100%

Tests required: GMAT, IELTS, MELAB, Pearson, TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

Research Tool Requirements include 12 hours or ANOVA, Regres-

sion/Econometrics, Psychometric Theory and Mutlivariate Statistics. See below for a full list of available courses. 1 credit professional development seminar.24 credit requirement for Ph.D. research.An Area Research Paper is required in the second year and a written field examination is required in the third year.

Program Description

Graduate Programs in the College of Business at Washington State University consist of a PhD in Business Administration with 7 areas of concentration (Accounting, Finance, Hospitality and Tourism, Information Systems, Management, Marketing, and Operations), a Master's of Accounting (MAcc) and Master's of Business Administration (MBA). The PhD is a four year residential program available in Pullman, WA. The MAcc is available in Pullman and Vancouver, WA. The MBA is available in Pullman, Tri-Cities, Vancouver and online with an Executive option also available online.

Degree Description

The goal of the doctoral program in accounting is to provide rigorous instruction in behavioral accounting theory, empirical methods, and the application of quantitative tools to accounting research.

Training and Professional Development Opportunities

Students are introduced to contemporary accounting research literature in the department's doctoral seminars and also take graduate course work outside the department to support their research interests (e.g., in statistics, psychology, finance). In the accounting research workshops, doctoral students are exposed to faculty members' and visiting scholars' research. Faculty members work closely with students and assist them in developing and publishing research projects.

Post-Graduate Employment Opportunities

Upon completion, graduates will have a comprehensive background in the theories, research paradigms, tools, and methods of behavioral accounting research, and will be prepared to enter careers at the research university level.

Post-Graduate Career Placements

Oklahoma State University, University of Missouri at Kansas City, Montana State University, Bozeman, Loyola Marymount, Kent State University, California State University-Sacramento, East Carolina University, Bowling Green State University

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E-mail: gpbusadmin@wsu.edu

Faculty

Siew Chan, Debra Sanders, Steven Thornburg, Bernard Wong-On-Wing and Dong Yu.

ACCTG

530 **Accounting Theory** 3 Prereq Acctg 331. Recent developments with respect to the determination of income and the valuation of assets.

532 **Contemporary Accounting Cases and Problems** 3 Prereq Acctg 331. Accounting theory applied to external financial reporting practices.

533 **Administrative Control** 3 Prereq enrollment in the MBA program. Managerial evaluation of budgeting, cost accounting, and financial analysis techniques; their utilization in control of operations.

535 **Advanced Taxation** 3 Prereq Acctg 335. Federal income tax impact on corporations, S corporations, partnerships, estates, trusts and their beneficial owners.

537 **Professional Research** 3 Prereq Acctg 331; Acctg 335. Methodology used by accounting professionals to research applied problems in taxation, accounting, and auditing; communicate results.

538 **Seminar in Cost/Managerial Accounting** 3 Cost concepts, cost and managerial accounting systems; current issues and research in cost and managerial accounting.

539 **Seminar in Public Accounting and Auditing** 3 Prereq Acctg 439. Public accounting and auditing to present; current issues including statistical sampling and computers.

540 **Corporate Taxation** 3 Prereq admission to Master of Accounting program. Application of federal tax provisions and rules pertaining to corporations, including "S" corporations; tax planning and consequences of corporate decisions.

541 **Flow Through Entities** 3 Prereq admission to Master of Accounting program. Tax law and preparation requirements for entities in which tax elements passes thorough to the owner's individual income tax return.

542 **Gifts, Estates and Trusts** 3 Prereq admission to Master of Accounting program. Estate and gift tax law.

543 **Special Topics in Accounting** 3 May be repeated for credit; cumulative maximum 6 hours. Prereq admission to Master of Accounting program. Critical topics in accounting including new developments.

544 **Advanced Accounting Systems and Auditing** 3 Prereq admission to Master of Accounting program. Advanced topics in accounting systems, auditing and controls.

550 **Introduction to Financial and Managerial Accounting** V 2-3 Prereq enrollment in the MBA program. Fundamentals of financial and managerial accounting; primarily for graduate students who wish to meet the MBA core requirements in accounting.

596 **Doctoral Topics** 3 May be repeated for credit; cumulative maximum 15 hours. Advanced topics in accounting.

600 **Special Projects or Independent Study** V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 **Master's Special Problems, Directed Study, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 **Doctoral Research, Dissertation, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

Business Administration

B A

598 **Research and Professional Development** 1 May be repeated for credit; cumulative maximum 6 hours. Ph.D.-level professional development colloquium designed to improve research, teaching, and presentation skills and to provide professional socialization.

Business Administration

MGTOP

598 **Research and Professional Development** 1 May be repeated for credit; cumulative maximum 6 hours. Ph.D.-level professional development colloquium designed to improve research, teaching, and presentation skills and to provide professional socialization.

Business Administration

MKTG

593 **Seminar in Research Design** 3 Advanced, doctoral-level topics in research design.

Business Administration

PSYCH

511 Analysis of Variance and Experimental Design 4 Prereq Psych 311 or statistics course. Parametric, nonparametric, repeated-measures, and multivariate ANOVA; planned comparisons; confidence intervals and power analysis; experimental design and variants.

512 Correlation, Regression, and Quasi-Experimental Design 3 Prereq Psych 511. Simple and multiple correlation and regression; time-series analysis; factor analysis; field research and quasi-experimental design.

513 Seminar in Quantitative Methods and Research Design 3 May be repeated for credit. Prereq Psych 512. Advanced topics in specialized quantitative procedures and in design of research in psychology.

514 Psychometrics 3 Prereq Psych 512. Scientific construction of behavioral assessment instruments, including validation and reliability; types of scales and responses; statistical scaling; test theory issues.

Business Administration

STAT

514 Nonparametric Statistics 3 Prereq Stat 512. Conceptual development of nonparametric methods including one, two, and k-sample tests for location and scale, randomized complete blocks, rank correlation, and runs test; power, sample size, efficiency, and ARE.

519 Applied Multivariate Analysis 3 Prereq MgtOp 591 or Stat 443. Same as MgtOp 519.

Business Administration

Degree offered: Doctor of Philosophy (Business Administration)

Program Description

Graduate Programs in the College of Business at Washington State University consist of a PhD in Business Administration with 7 areas of concentration (Accounting, Finance, Hospitality and Tourism, Information Systems, Management, Marketing, and Operations), a Master's of Accounting (MAcc) and Master's of Business Administration (MBA). The PhD is a four year residential program available in Pullman, WA. The MAcc is available in Pullman and Vancouver, WA. The MBA is available in Pullman, Tri-Cities, Vancouver and online with an Executive option also available online.

Business Administration - Finance

Degree offered: Doctor of Philosophy

Faculty working with graduate students: 7

Graduate students: 11

Graduate students receiving assistantships or scholarships: 100%

Tests required: GMAT, IELTS, MELAB, Pearson, TOEFL, TOEFLI

Deadline: Fall: January 10

Requirements

Research Tool Requirements include classes in micro economics, macro economics, and advanced econometrics. See below for a full list of available courses. 1 credit professional development seminar. 24 credit requirement for Ph.D. research. An Area Research Paper is required in the second year and a written field examination is required in the third year.

Program Description

Graduate Programs in the College of Business at Washington State University consist of a PhD in Business Administration with 7 areas of concentration (Accounting, Finance, Hospitality and Tourism, Information Systems, Management, Marketing, and Operations), a Master's of Accounting (MAcc) and Master's of Business Administration (MBA). The PhD is a four year residential program available in Pullman, WA. The MAcc is available in Pullman and Vancouver, WA. The MBA is available in Pullman, Tri-Cities, Vancouver and online with an Executive option also available online.

Degree Description

The doctorate in business administration with an emphasis in finance at Washington State University is designed to prepare graduates for careers in research and teaching. The primary goal of the finance doctoral program is to train academics for placements at AACSB-accredited universities throughout the United States and abroad. The program encompasses a variety of formal and informal interactions and projects with faculty and others, as well as course work, comprehensive exams, teaching experience and dissertation research. It enables students to develop substantial competencies in the theory, practice, and research methodology essential to the advancement of finance knowledge, while accommodating individual backgrounds, experiences, and objectives. Course work covers topics associated with the scholarly pursuit of marketing as well as topics from supporting fields of inquiry such as psychology, sociology, and management. Extensive coverage of research methods and statistics associated with the social sciences also is a large component of the program. In addition to specific coursework, the marketing doctoral program also provides an environment in which students can develop research competencies in close association with the marketing faculty and other graduate students.

Post-Graduate Career Placements

Gonzaga University, Curtin Tech (Australia), Eastern Washington University, Eastern Montana College, Marist College, New York, University Mexico, Marquette University, Washington State University, Loyola Maramount, Drake University, Western Illinois University, Concordia University (Montreal), Nakai University (China), Brock University (Ontario), University of St. Thomas, University of Southern Mississippi, Illinios State University, University of Wyoming, University of Toledo, Central Michigan University

Contact Information

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Faculty

Gene Lai, Michael McNamara, John Nofsinger, Donna Paul, Harry Turtle, Nathan Walcott and David Whidbee.

Business Administration

B A

598 Research and Professional Development 1 May be repeated for credit; cumulative maximum 6 hours. Ph.D.-level professional development colloquium designed to improve research, teaching, and presentation skills and to provide professional socialization.

Business Administration

FIN

500 Macroeconomic Theory I 3 Prereq EconS 302; one year of calculus. Same as EconS 500.

501 Microeconomic Theory I 3 Prereq EconS 301 or 305; one year calculus. Same as EconS 501.

502 Macroeconomic Theory III 3 Prereq EconS 500. Same as EconS 502.

503 Economic Theory IV 3 Prereq EconS 501. Same as EconS 503.

510 Statistics for Economists 3 Prereq college calculus and matrix algebra. Same as EconS 510.

511 Econometrics I 3 Prereq EconS 510. Same as EconS 511.

512 Econometrics II 3 Prereq EconS 501; EconS 511. Same as EconS 512.

521 Interest Rates and Financial Markets 3 Prereq Fin 325 or 525. Real and nominal interest rates; bond pricing; term and risk structure of interest rates; investment and commercial banking; financial futures.

525 Advanced Financial Management 3 Prereq enrollment in the MBA program. Theory of financial management; quantitative analysis of financial problems of the firm; empirical studies on financing modern corporations.

527 Investment Analysis 3 Fin 325 or 525. A decision-making approach to the problems of asset management for personal and business portfolio.

528 Portfolio Theory and Financial Engineering 3 Prereq Fin 325, 427, or 527. The theory of portfolio management and the use of derivative securities in portfolio risk management.

581 International Finance 3 Prereq Fin 325 or 525. Same as I Bus 581.

596 Advanced Topics in Financial Economics V 1-6 May be repeated for credit; cumulative maximum 12 hours. Prereq Fin 504 and 512 or permission of instructor. Topics may include financial theory and empirical methods as applied to financial management, investments, international finance, and markets/institutions.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Business Administration

MATH

548 Numerical Analysis 3 Prereq FORTRAN, C, or other programming language; Math 315; graduate standing. Graduate-level counterpart of Math 448; additional requirements. Credit not granted for both Math 448 and 548.

Business Administration

MGTOP

516 Time Series 3 Prereq MgtOp 515 or Stat 443. ARIMA models; identification, estimation, diagnostics, and forecasting; seasonal adjustments, outlier detection, intervention analysis and transfer function modeling.

519 Applied Multivariate Analysis 3 Prereq MgtOp 591 or Stat 443. Principal components, factor analysis, discriminant function, cluster analysis, multivariate normal distribution, Hotelling's T2 and MANOVA.

596 Doctoral Topics V 1-4 May be repeated for credit; cumulative maximum 15 hours. Advanced topics in management and operations.

Business Administration

MKTG

593 Seminar in Research Design 3 Advanced, doctoral-level topics in research design.

Business Administration

STAT

522 Biostatistics and Statistical Epidemiology 3 Prereq Math 171 or 220; Stat 412. Rigorous approach to biostatistical and epidemiological methods including relative risk, odds ratio, cross-over designs, survival analysis and generalized linear models.

530 Applied Linear Models 3 (2-2) Prereq Stat 360 or 412. The design and analysis of experiments by linear models.

536 Statistical Computing 3 (2-3) Prereq (Stat 443 and 530), Stat 523, or by instructor's permission. Generation of random variables, Monte Carlo simulation, bootstrap and jackknife methods, EM algorithm, Markov chain Monte Carlo methods.

556 Introduction to Statistical Theory 3 Prereq Stat 430 or 443; graduate standing. Graduate-level counterpart of Stat 456; additional requirements. Credit not granted for both Stat 456 and 556.

Business Administration - Hospitality and Tourism

Degree offered: Doctor of Philosophy

Faculty working with graduate students: 5

Graduate students: 3

Graduate students receiving assistantships or scholarships: 100%

Tests required: GMAT, IELTS, MELAB, Pearson, TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

Research Tool Requirements include 12 hours or ANOVA, Regression/Econometrics, Psychometric Theory and Mutlivariate Statistics. See below for a full list of available courses. 1 credit professional development seminar.24 credit requirement for Ph.D. research.An Area Research Paper is required in the second year and a written field examination is required in the third year.

Program Description

Graduate Programs in the College of Business at Washington State University consist of a PhD in Business Administration with 7 areas of concentration (Accounting, Finance, Hospitality and Tourism, Information Systems, Management, Marketing, and Operations), a Master's of Accounting (MAcc) and Master's of Business Administration (MBA). The PhD is a four year residential program available in Pullman, WA. The MAcc is available in Pullman and Vancouver, WA. The MBA is available in Pullman, Tri-Cities, Vancouver and online with an Executive option also available online.

Degree Description

The PhD in business administration with an emphasis in hospitality and tourism management is designed to prepare graduates for careers in research and teaching at institutions throughout the United States and abroad. Applicants with strong hospitality and tourism business background are preferred. Incoming students are expected to have both good written and oral communication skills, as well as good analytical skills to facilitate the mastery of research methods and statistics. The course of study requires a battery of hospitality and tourism business management courses as well as a group of research design and statistics courses. Students are also expected to take courses from supporting fields of inquiry such as psychology, sociology, management, marketing, etc. The degree normally takes four years to complete and involves taking courses, developing an area (2nd-year) paper, passing a comprehensive exam, and the completion of a doctoral dissertation.

Training and Professional Development Opportunities

Coursework in the area of specialization is intended to provide necessary skills and knowledge to conduct research in a chosen field. Courses must be related to an area of study selected by the student and approved by the doctoral student's committee. Supporting doctoral level coursework may be selected from areas such as (but not limited to) research seminars in anthropology, psychology, sociology, economics, management, international business, information systems, marketing, communication, etc. Additional coursework in Hospitality and Tourism Business Management may also be taken, with approval from the doctoral student's committee. Annual Review and Comprehensive ExamsThe goal of the annual reviews and comprehensive exams is to assess the candidate's overall mastery of the core body of knowledge in the field and the degree of preparation to undertake research independently or with minimal supervision. The Ph.D. Program director and committee along with appropriate advisors will annually review the progress of the students in terms of publi-

cations and research effort. This may entail a qualifying exam each year depending on the program committee's review of the candidate. The Comprehensive Exam (scheduled sometime during the third year in the program) will test the candidate's knowledge in five areas:1.Hospitality and tourism major field requirements: Hospitality and Tourism core knowledge includes a thorough understanding of hospitality and tourism, and behavioral research methods.2.Business electives: The student should be able to demonstrate an appropriate level of understanding of theories and research methods aligned with those business disciplines chosen for further study, including finance, information systems, international business, management & operations, and/or marketing.3.Hospitality and tourism research: The student should be able to demonstrate a thorough understanding of hospitality and tourism research, including explanatory theories and past research findings. In addition, the candidate is expected to demonstrate command over the relevant literature from his/her supporting field.4.Hospitality and tourism research methods and statistics: The student should also have an extensive knowledge of statistics and the research methodologies that can be employed to study hospitality and tourism phenomena from a behavioral standpoint.5.Oral and written communication skills: Given the program's focus on producing hospitality and tourism scholars who can be successful at other accredited, peer or better research universities, the student is also expected to show a high level of written and oral communication skills exhibited in the written and oral comprehensive exams, research presentations at national/international conferences, and publications in hospitality & tourism journals.

Contact Information

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Faculty

Geng-Qing Chi, Dogan Gursoy, Hyun Kim, Dennis Reynolds and Nancy Swanger.

Business Administration

B A

598 Research and Professional Development 1 May be repeated for credit; cumulative maximum 6 hours. Ph.D.-level professional development colloquium designed to improve research, teaching, and presentation skills and to provide professional socialization.

Business Administration

ECONS

511 Econometrics I 3 Prereq EconS 510. Single equation linear and nonlinear models; estimation, inference, finite and asymptotic properties, effects and mitigation of violations of classical assumptions.

512 Econometrics II 3 Prereq EconS 501; EconS 511. Econometric methods for systems estimation; simultaneous equations, discrete and limited dependent variable, panel data, and time series data.

Business Administration

FIN

596 Advanced Topics in Financial Economics V 1-6 May be repeated for credit; cumulative maximum 12 hours. Prereq Fin 504 and 512 or permission of instructor. Topics may include financial theory and empirical methods as applied to financial management, investments, international finance, and markets/institutions.

Hospitality Business Management

HBM

581 Services Management 3 Design and management of service systems in hospitality operations; control of customer interaction, personnel activities and inventory.

597 Special Topics 3 Prereq graduate standing.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Hospitality Business Management

I BUS

580 International Business Management 3 Decision making in the international environment; political, cultural, and economic risk management.

Hospitality Business Management

MGTOP

519 Applied Multivariate Analysis 3 Prereq MgtOp 591 or Stat 443. Principal components, factor analysis, discriminant function, cluster analysis, multivariate normal distribution, Hotelling's T2 and MANOVA.

591 Statistical Analysis for Business Decisions 3 Prereq enrollment in the MBA program. Analytical skills for decision-making; data collection and analysis, sampling, inferential, regression methodologies, experimental design, time series, forecasting analysis.

597 Doctoral Topics 3 May be repeated for credit; cumulative maximum 9 hours. Advanced topics in management and operations.

Management Information Systems

MIS

572 Database Management Systems 3 Prereq admission to MBA program. Database management, data modeling, system design and implementation; the application of DBMS technologies to organizational and business problems.

574 Telecommunications and Networking in Business 3 Prereq admission to MBA program. Business applications of data communications, infrastructure, protocols, topologies and management, the design of wired and wireless solutions, and related research issues.

582 Systems Analysis and Design 3 Prereq admission to MBA program. Research on and application of systems analysis, design, development and management of information systems; systems development life cycle.

Management Information Systems

MKTG

590 Seminar in Consumer Behavior 3 Advanced, doctoral-level topics in consumer behavior.

591 Seminar in Marketing Management 3 Advanced, doctoral-level topics in marketing management.

592 Seminar in Marketing Theory 3 Advanced, doctoral-level topics in marketing theory.

593 Seminar in Research Design 3 Advanced, doctoral-level topics in research design.

Management Information Systems

PSYCH

511 Analysis of Variance and Experimental Design 4 Prereq Psych 311 or statistics course. Parametric, nonparametric, repeated-measures, and multivariate ANOVA; planned comparisons; confidence intervals and power analysis; experimental design and variants.

512 Correlation, Regression, and Quasi-Experimental Design 3 Prereq Psych 511. Simple and multiple correlation and regression; time-series analysis; factor analysis; field research and quasi-experimental design.

513 Seminar in Quantitative Methods and Research Design 3 May be repeated for credit. Prereq Psych 512. Advanced topics in specialized quantitative procedures and in design of research in psychology.

514 Psychometrics 3 Prereq Psych 512. Scientific construction of behavioral assessment instruments, including validation and reliability; types of scales and responses; statistical scaling; test theory issues.

Management Information Systems

SOC

521 Regression Models 3 Prereq Soc 421. Simple and multiple regression, structural equation models, nonlinear applications, applications for discrete dependent variables.

522 Advanced Sociological Methodology 3 May be repeated for credit; cumulative maximum 12 hours. Prereq Soc 521. Scaling theory, sampling theory, experimental design, measurement of association, multivariate analysis, current methods and techniques.

Management Information Systems

STAT

507 Experimental Design 3 Prereq Stat 512. Methods of constructing and analyzing designs for experimental investigations; analysis of designs with unequal subclass numbers; concepts of blocking randomization and replication; confounding in factorial experiments; incomplete block designs; response surface methodology.

512 Statistical Methods in Research II 3 (2-2) Prereq Stat 412 or equivalent. Analysis and interpretation of designed experiments: CRD, RCBD, spit-plot and repeated measures, multiple comparisons, multiple regression modeling, validation of assumptions.

519 Applied Multivariate Analysis 3 Prereq MgtOp 591 or Stat 443. Same as MgtOp 519.

520 Statistical Analysis of Qualitative Data 3 Prereq Math 140, 171, 201, 202, or 220; and one 3 hour statistics course. Binomial, Poisson, multinomial distribution; contingency tables, Fisher's tests, log-linear models; ordinal data; applications in biology, business, psychology, and sociology.

530 Applied Linear Models 3 (2-2) Prereq Stat 360 or 412. The design and analysis of experiments by linear models.

533 Theory of Linear Models 3 Prereq Math 420, Stat 430, or 456. Theoretical basis of linear regression and analysis of variance models; a unified approach based upon the generalized inverse.

535 Regression Analysis 3 Prereq Stat 430 or 456. Conceptual development of regression; estimation, prediction, tests of hypotheses, variable selection, diagnostics, model validation, correlation, and nonlinear regression.

Business Administration - Information Systems

Degree offered: Doctor of Philosophy

Faculty working with graduate students: 6

Graduate students: 12

Graduate students receiving assistantships or scholarships: 100%

Tests required: GMAT, IELTS, MELAB, Pearson, TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

Students must take a minimum of 12 credits of statistics, which should cover topics such asdesign of experiments, ANOVA, multivariate analysis, regression, psychometric theory, andSEM. The Psych 511-514 series is the most recommended. 1 credit professional development seminar.24 credit requirement for Ph.D. research.An Area Research Paper is required in the second year and a written field examination is required in the third year.

Program Description

Graduate Programs in the College of Business at Washington State University consist of a PhD in Business Administration with 7 areas of concentration (Accounting, Finance, Hospitality and Tourism, Information Systems, Management, Marketing, and Operations), a Master's of Accounting (MAcc) and Master's of Business Administration (MBA). The PhD is a four year residential program available in Pullman, WA. The MAcc is available in Pullman and Vancouver, WA. The MBA is available in Pullman, Tri-Cities, Vancouver and online with an Executive option also available online.

Degree Description

The Ph.D. in IS at WSU focuses on behavioral issues in MIS, enabling students to develop critical skills in both research and teaching, and therefore compete for, and succeed in, the best academic jobs in the country.

Post-Graduate Career Placements

University of Delaware, University of San Francisco Towson University, University of Nevada, Las Vegas, University of Virginia, University of Montana, University of North Texas

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Faculty

Paul Clay, Mauricio Featherman, Kshiti Joshi, Saonee Sarker, Suprateek Sarker and Joe Valacich.

Business Administration

B A

598 Research and Professional Development 1 May be repeated for credit; cumulative maximum 6 hours. Ph.D.-level professional development colloquium designed to improve research, teaching, and presentation skills and to provide professional socialization.

Business Administration

COM

509 Quantitative Research 3 Prereq graduate standing. Introduction to quantitative research in communication; hypothesis development, testing; basic statistics, interpretation; field surveys, laboratory and field experiments, content analysis.

591 Qualitative Research Methods 3 Prereq graduate standing. Historical, textual, and legal methodologies for theory-based evaluative and discourse studies in communication.

Management Information Systems

MIS

572 Database Management Systems 3 Prereq admission to MBA program. Database management, data modeling, system design and implementation; the application of DBMS technologies to organizational and business problems.

574 Telecommunications and Networking in Business 3 Prereq admission to MBA program. Business applications of data communications, infrastructure, protocols, topologies and management, the design of wired and wireless solutions, and related research issues.

582 Systems Analysis and Design 3 Prereq admission to MBA program. Research on and application of systems analysis, design, development and management of information systems; systems development life cycle.

596 Doctoral Topics 3 May be repeated for credit; cumulative maximum 9 hours. Prereq graduate standing. Advanced topics in management information systems.

598 MIS Research Topics 3 Major streams of research in MIS.

599 MIS Research Proposal Development 3 Prereq MIS 598. Seminar on the process of creating a MIS research proposal.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Management Information Systems

MKTG

593 Seminar in Research Design 3 Advanced, doctoral-level topics in research design.

Management Information Systems

PSYCH

511 Analysis of Variance and Experimental Design 4 Prereq Psych 311 or statistics course. Parametric, nonparametric, repeated-measures, and multivariate ANOVA; planned comparisons; confidence intervals and power analysis; experimental design and variants.

512 Correlation, Regression, and Quasi-Experimental Design 3 Prereq Psych 511. Simple and multiple correlation and regression; time-series analysis; factor analysis; field research and quasi-experimental design.

513 Seminar in Quantitative Methods and Research Design 3 May be repeated for credit. Prereq Psych 512. Advanced topics in specialized quantitative procedures and in design of research in psychology.

514 Psychometrics 3 Prereq Psych 512. Scientific construction of behavioral assessment instruments, including validation and reliability; types of scales and responses; statistical scaling; test theory issues.

515 Multilevel and Synthesized Data 3 Prereq Psych 512. Structural equation modeling, hierarchical linear modeling and meta-analysis and the software used to conduct these analyses.

Management Information Systems

SOC

520 Research Methods in Sociology 3 Methodology of social research at the professional level.

523 Qualitative Methods Practicum 3 Prereq graduate standing. Introduction to qualitative research methods as used in social sciences; epistemological underpinnings and empirical techniques.

Business Administration - Management

Degree offered: Doctor of Philosophy (Business Administration)

Faculty working with graduate students: 9

Graduate students: 7

Graduate students receiving assistantships or scholarships: 100%

Tests required: GMAT, IELTS, MELAB, Pearson, TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

Research Tool Requirements include 12 hours of ANOVA, Regression/Econometrics, Psychometric Theory and Mutlivariate Statistics. See below for a full list of available courses. 1 credit professional development seminar. 24 total credit requirement for Ph.D. research. An Area Research Paper is required in the second year and a written field examination is required in the third year.

Program Description

Graduate Programs in the College of Business at Washington State University consist of a PhD in Business Administration with 7 areas of concentration (Accounting, Finance, Hospitality and Tourism, Information Systems, Management, Marketing, and Operations), a Master's of Accounting (MAcc) and Master's of Business Administration (MBA). The PhD is a four year residential program available in Pullman, WA. The MAcc is available in Pullman and Vancouver, WA. The MBA is available in Pullman, Tri-Cities, Vancouver and online with an Executive option also available online.

Degree Description

The PhD in Management requires an understanding of the content of management and the ability to conduct scientific research using tools of statistical analysis and research design. As such, the course of study requires a battery of management courses as well as a group of research design and statistics courses. The degree normally takes four years to complete and involves taking courses, developing an area (2nd-year) paper, passing a comprehensive exam, and the completion of a doctoral dissertation. Candidates who are able to defend their dissertation proposal before the fourth year are afforded a fifth year of support (if desired).

Training and Professional Development Opportunities

Conference funding is generally available for students presenting a paper if the budget allows for it.

Post-Graduate Employment Opportunities

None.

Post-Graduate Career Placements

University of Wisconsin, Milwaukee , Boise State University , University of Idaho, National Sun Yat Sen, Taiwan, University of North Dakota, Wichita State University, University of Idaho, University of Alaska, Anchorage, Chinese University-Hong Kong, College of St. Benedict, Western Illinois University, University of Wisconsin, White Water, St. Ambrose University, Bryant College, Central Washington University, University of Mississippi, US Army War College, Carlisle, PA, Cleveland State University, Private Industry (Samsung), Chapman University, Los Angeles, Fort Hays State University, Kansas, University of North Texas,James Madison University

Contact Information

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Faculty

Jonathan Arthurs, Kenneth Butterfield, John Cullen, Jerry Goodstein, Kristine Kuhn, Rebecca Portnoy, Arrvvind Sahaym, Paul Skilton and Thomas Tripp.

Business Administration

B A

596 Doctoral Topics V 1-4 May be repeated for credit; cumulative maximum 15 hours. Advanced topics in management and operations.

598 Research and Professional Development 1 May be repeated for credit; cumulative maximum 6 hours. Ph.D.-level professional development colloquium designed to improve research, teaching, and presentation skills and to provide professional socialization.

Business Administration

ECONS

511 Econometrics I 3 Prereq EconS 510. Single equation linear and nonlinear models; estimation, inference, finite and asymptotic properties, effects and mitigation of violations of classical assumptions.

512 Econometrics II 3 Prereq EconS 501; EconS 511. Econometric methods for systems estimation; simultaneous equations, discrete and limited dependent variable, panel data, and time series data.

Business Administration

MGTOP

596 Doctoral Topics V 1-4 May be repeated for credit; cumulative maximum 15 hours. Advanced topics in management and operations.

597 Doctoral Topics 3 May be repeated for credit; cumulative maximum 9 hours. Advanced topics in management and operations.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Business Administration

PSYCH

511 Analysis of Variance and Experimental Design 4 Prereq Psych 311 or statistics course. Parametric, nonparametric, repeated-measures, and multivariate ANOVA; planned comparisons; confidence intervals and power analysis; experimental design and variants.

512 Correlation, Regression, and Quasi-Experimental Design 3 Prereq Psych 511. Simple and multiple correlation and regression; time-series analysis; factor analysis; field research and quasi-experimental design.

513 Seminar in Quantitative Methods and Research Design 3 May be repeated for credit. Prereq Psych 512. Advanced topics in specialized quantitative procedures and in design of research in psychology.

514 Psychometrics 3 Prereq Psych 512. Scientific construction of behavioral assessment instruments, including validation and reliability; types of scales and responses; statistical scaling; test theory issues.

Business Administration

SOC

521 Regression Models 3 Prereq Soc 421. Simple and multiple regression, structural equation models, nonlinear applications, applications for discrete dependent variables.

Business Administration

STAT

533 Theory of Linear Models 3 Prereq Math 420, Stat 430, or 456. Theoretical basis of linear regression and analysis of variance models; a unified approach based upon the generalized inverse.

535 Regression Analysis 3 Prereq Stat 430 or 456. Conceptual development of regression; estimation, prediction, tests of hypotheses, variable selection, diagnostics, model validation, correlation, and nonlinear regression.

Business Administration - Marketing

Degree offered: Doctor of Philosophy

Faculty working with graduate students: 8

Graduate students: 11

Graduate students receiving assistantships or scholarships: 90%

Tests required: GMAT, IELTS, MELAB, Pearson, TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

Requirements: Research Tool Requirements include 12 hours or ANOVA, Regression/Econometrics, Psychometric Theory and Mutlivariate Statistics. See below for a full list of available courses. 1 credit professional development seminar. 24 credit requirement for Ph.D. research. An Area Research Paper is required in the second year and a written field examination is required in the third year.

Program Description

Graduate Programs in the College of Business at Washington State University consist of a PhD in Business Administration with 7 areas of concentration (Accounting, Finance, Hospitality and Tourism, Information Systems, Management, Marketing, and Operations), a Master's of Accounting (MAcc) and Master's of Business Administration (MBA). The PhD is a four year residential program available in Pullman, WA. The MAcc is available in Pullman and Vancouver, WA. The MBA is available in Pullman, Tri-Cities, Vancouver and online with an Executive option also available online.

Degree Description

The doctorate in business administration with an emphasis in marketing at Washington State University is designed to prepare graduates for careers in research and teaching. The primary goal of the marketing doctoral program is to train academics for placements at AACSB-accredited peer institutions (preferably with a doctoral program of their own) throughout the United States and abroad. Those with a completed master's degree in a business discipline can complete the doctorate in four years of full-time resident study.The program encompasses a variety of formal and informal interactions and projects with faculty and others, as well as course work, comprehensive exams, and dissertation research. It enables students to develop substantial competencies in the theory, practice, and research methodology essential to the advancement of marketing knowledge, while accommodating individual backgrounds, experiences, and objectives.Course work covers topics associated with the scholarly pursuit of marketing as well as topics from supporting fields of inquiry such as psychology, sociology, and management. Extensive coverage of research methods and statistics associated with the social sciences also is a large component of the program. In addition to specific coursework, the marketing doctoral program also provides an environment in which students can develop research competencies in close association with the marketing faculty and other graduate students.

Post-Graduate Employment Opportunities

Academic Settings

Post-Graduate Career Placements

Colorado State UniversityMichigan State UniversityKuwait UniversityNorthern Kentucky UniversitySabanci University (Istanbul)University of Houston-Victoria

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Department Chair and Acting PhD Coordinator
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Faculty

Babu John Mariadoss, Jeffrey Joireman, Ioannis Kareklas, Darrel Muehling, Eric Spangenberg, David Sprott, Patriya Tansuhaj and Uchila Umesh.

Business Administration

B A

598 Research and Professional Development 1 May be repeated for credit; cumulative maximum 6 hours. Ph.D.-level professional development colloquium designed to improve research, teaching, and presentation skills and to provide professional socialization.

Business Administration

ECONS

511 Econometrics I 3 Prereq EconS 510. Single equation linear and nonlinear models; estimation, inference, finite and asymptotic properties, effects and mitigation of violations of classical assumptions.

512 Econometrics II 3 Prereq EconS 501; EconS 511. Econometric methods for systems estimation; simultaneous equations, discrete and limited dependent variable, panel data, and time series data.

Business Administration

MGTOP

519 Applied Multivariate Analysis 3 Prereq MgtOp 591 or Stat 443. Principal components, factor analysis, discriminant function, cluster analysis, multivariate normal distribution, Hotelling's T2 and MANOVA.

591 Statistical Analysis for Business Decisions 3 Prereq enrollment in the MBA program. Analytical skills for decision-making; data collection and analysis, sampling, inferential, regression methodologies, experimental design, time series, forecasting analysis.

Business Administration

MKTG

590 Seminar in Consumer Behavior 3 Advanced, doctoral-level topics in consumer behavior.

591 Seminar in Marketing Management 3 Advanced, doctoral-level topics in marketing management.

593 Seminar in Research Design 3 Advanced, doctoral-level topics in research design.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Business Administration

PSYCH

511 Analysis of Variance and Experimental Design 4 Prereq Psych 311 or statistics course. Parametric, nonparametric, repeated-measures, and multivariate ANOVA; planned comparisons; confidence intervals and power analysis; experimental design and variants.

512 Correlation, Regression, and Quasi-Experimental Design 3 Prereq Psych 511. Simple and multiple correlation and regression; time-series analysis; factor analysis; field research and quasi-experimental design.

513 Seminar in Quantitative Methods and Research Design 3 May be repeated for credit. Prereq Psych 512. Advanced topics in specialized quantitative procedures and in design of research in psychology.

514 Psychometrics 3 Prereq Psych 512. Scientific construction of behavioral assessment instruments, including validation and reliability; types of scales and responses; statistical scaling; test theory issues.

Business Administration

SOC

521 Regression Models 3 Prereq Soc 421. Simple and multiple regression, structural equation models, nonlinear applications, applications for discrete dependent variables.

522 Advanced Sociological Methodology 3 May be repeated for credit; cumulative maximum 12 hours. Prereq Soc 521. Scaling theory, sampling theory, experimental design, measurement of association, multivariate analysis, current methods and techniques.

Business Administration

STAT

507 Experimental Design 3 Prereq Stat 512. Methods of constructing and analyzing designs for experimental investigations; analysis of designs with unequal subclass numbers; concepts of blocking randomization and replication; confounding in factorial experiments; incomplete block designs; response surface methodology.

519 Applied Multivariate Analysis 3 Prereq MgtOp 591 or Stat 443. Same as MgtOp 519.

520 Statistical Analysis of Qualitative Data 3 Prereq Math 140, 171, 201, 202, or 220; and one 3 hour statistics course. Binomial, Poisson, multinomial distribution; contingency tables, Fisher's tests, log-linear models; ordinal data; applications in biology, business, psychology, and sociology.

530 Applied Linear Models 3 (2-2) Prereq Stat 360 or 412. The design and analysis of experiments by linear models.

533 Theory of Linear Models 3 Prereq Math 420, Stat 430, or 456. Theoretical basis of linear regression and analysis of variance models; a unified approach based upon the generalized inverse.

535 Regression Analysis 3 Prereq Stat 430 or 456. Conceptual development of regression; estimation, prediction, tests of hypotheses, variable selection, diagnostics, model validation, correlation, and nonlinear regression.

Business Administration - MBA (Online)

Degree offered: Master of Business Administration

Faculty working with graduate students: 12

Graduate students: 45

Program offered: DDP, DDP

Tests required: GMAT, IELTS, MELAB, Pearson, TOEFL, TOEFLI

Deadline: Fall 1: August 8
Fall 2: October 3
Spring 1: December 22
Spring 2: February 19
Summer 1: April 25
Summer 2: June 13

Requirements

The MBA program consists of 12 courses. Nine core courses provide students with skill development in Strategic Leadership, Management of Innovation and in Functional Business Areas including Accounting, Finance, Services Management and Marketing. Three electives are offered at intervals for degree completion. The final project for this program is a unique comprehensive business plan.

Program Description

Graduate Programs in the College of Business at Washington State University consist of a PhD in Business Administration with 7 areas of concentration (Accounting, Finance, Hospitality and Tourism, Information Systems, Management, Marketing, and Operations), a Master's of Accounting (MAcc) and Master's of Business Admin-

istration (MBA). The PhD is a four year residential program available in Pullman, WA. The MAcc is available in Pullman and Vancouver, WA. The MBA is available in Pullman, Tri-Cities, Vancouver and online with an Executive option also available online.

Degree Description

Washington State University's MBA online program exposes students to broad-ranging coursework that helps to hone entrepreneurial instincts and skills that can lead to significant commercial impact. The program is designed for students to learn how to successfully drive the execution and delivery of business initiatives as well as refine and improve upon existing opportunities. Washington State University produces MBA online graduates who are equipped with the tools and intellect to lead across geographic boundaries and negotiate complex business challenges.

Contact Information

Online MBA Admissions
omba.wsu.edu for live chat with advisor
Telephone: 1-877-960-2029 x3608
Fax: 1-866-563-8901
E-mail: info@wsumba.com

Faculty

Sung Ahn, Jonathan Arthurs, Kenneth Butterfield, Yany Gregoire, Dogan Gursoy, Joseph Harris, Robert Jenefsky, Velle Kolde, Donna Paul, Ronald Pike, Suprateek Sarker and David Sprott.

ACCTG

533 Administrative Control 3 Prereq enrollment in the MBA program. Managerial evaluation of budgeting, cost accounting, and financial analysis techniques; their utilization in control of operations.

Business Administration

B A

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Business Administration

ENTRP

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

Business Administration

FIN

526 Problems in Financial Management 3 Prereq enrollment in the MBA program; Fin 325 or 525. Application of financial principles to problems in financial management; credit policy, capital budgeting, leasing and mergers, cash management.

Hospitality Business Management

HBM

581 Services Management 3 Design and management of service systems in hospitality operations; control of customer interaction, personnel activities and inventory.

Hospitality Business Management

MGTOP

590 Strategy Formulation and Organizational Design 3 Prereq enrollment in the MBA program. Relationship between the formulation of strategy and the selection of effective organizational structures and systems.

591 Statistical Analysis for Business Decisions 3 Prereq enrollment in the MBA program. Analytical skills for decision-making; data collection and analysis, sampling, inferential, regression methodologies, experimental design, time series, forecasting analysis.

593 Managerial Leadership and Productivity 3 Prereq enrollment in the MBA program. Organizational behavior and human motivation in the workplace; organization and leadership theories, studies, projects and models leading to improved productivity.

Management Information Systems

MIS

580 Information Systems Management 3 Prereq enrollment in the MBA program. Data processing organization; operations, application development, computer selection, management of computer personnel and systems.

Management Information Systems

MKTG

506 Marketing Management and Administrative Policy 3 Prereq enrollment in the MBA program. Marketing management and administrative policies as they relate to concepts, strategies, and decision making.

Business Administration - MBA (Tricities)

Degree offered: Master of Business Administration

Faculty working with graduate students: 5

Graduate students: 55

Program offered: Tri-Cities, Tri-Cities

Tests required: GMAT, IELTS, MELAB, Pearson, TOEFL, TOEFLI

Deadline: Fall 2011: July 15
Spring 2012: November 30

Requirements

The MBA program at WSU Tri-Cities consists of 7 core courses, 3 elective courses, 7 foundation courses, and two additional credits for the final project and presentation required during the student's last semester. The seven core courses provide students with skill development in strategic leadership, decision making, and in functional business areas including accounting, finance, and marketing. The three electives allow students to concentrate in areas of business interest. The seven foundation courses are designed to accommodate the diversity of entering students with varying academic backgrounds while ensuring a solid foundation in all business areas. These courses will be waived if equivalent coursework has been completed, however, if these courses are needed they must be completed prior to enrollment in the MBA core or elective courses.

Program Description

Graduate Programs in the College of Business at Washington State University consist of a PhD in Business Administration with 7 areas of concentration (Accounting, Finance, Hospitality and Tourism, Information Systems, Management, Marketing, and Operations), a Master's of Accounting (MAcc) and Master's of Business Administration (MBA). The PhD is a four year residential program available in Pullman, WA. The MAcc is available in Pullman and Vancouver, WA. The MBA is available in Pullman, Tri-Cities, Vancouver and online with an Executive option also available online.

Degree Description

The MBA program at WSU Tri-Cities is designed as a part-time program for working professionals with broad academic backgrounds and a desire to prepare themselves for leadership responsibilities in today's global economy. The program blends theory with practice to build the technical tools and relational skills demanded of top business leaders while providing experience in identifying, analyzing and interpreting data relevant to manangement decisions.

Training and Professional Development Opportunities

Opportunities to earn 6-sigma green or black belts

Post-Graduate Employment Opportunities

Any field of business

Post-Graduate Career Placements

Some have started their own businesses, some have been promoted within their current companies, and still others have moved on to changing their career path. We had a mining engineer who started the program with the goal of going into hospital administration. Within three months of completing his degree, he had the job he wanted with a hospital.

Contact Information

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Faculty

Nancy Ashley, Timothy Baker, Sheen Liu, Elina Petrova and Paul Skilton.

ACCTG

533 **Administrative Control** 3 Prereq enrollment in the MBA program. Managerial evaluation of budgeting, cost accounting, and financial analysis techniques; their utilization in control of operations.

FIN

526 **Problems in Financial Management** 3 Prereq enrollment in the MBA program; Fin 325 or 525. Application of financial principles to problems in financial management; credit policy, capital budgeting, leasing and mergers, cash management.

MGTOP

590 **Strategy Formulation and Organizational Design** 3 Prereq enrollment in the MBA program. Relationship between the formulation of strategy and the selection of effective organizational structures and systems.

591 **Statistical Analysis for Business Decisions** 3 Prereq enrollment in the MBA program. Analytical skills for decision-making; data collection and analysis, sampling, inferential, regression methodologies, experimental design, time series, forecasting analysis.

593 **Managerial Leadership and Productivity** 3 Prereq enrollment in the MBA program. Organizational behavior and human motivation in the workplace; organization and leadership theories, studies, projects and models leading to improved productivity.

702 **Master's Special Problems, Directed Study, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

Management Information Systems

MIS

580 **Information Systems Management** 3 Prereq enrollment in the MBA program. Data processing organization; operations, application development, computer selection, management of computer personnel and systems.

Management Information Systems

MKTG

506 **Marketing Management and Administrative Policy** 3 Prereq enrollment in the MBA program. Marketing management and administrative policies as they relate to concepts, strategies, and decision making.

Business Administration - MBA (Vanouver)

Degree offered: Master of Business Administration

Graduate students: 50

Program offered: Vancouver, Vancouver

Tests required: GMAT, TOEFL

Deadline: Fall: January 10
Spring: October 1 (July 1 international)
Summer: January 10

Requirements

all Professional MBA students conduct a final 2-credit oral presentation/exam

Program Description

Graduate Programs in the College of Business at Washington State University consist of a PhD in Business Administration with 7 areas of concentration (Accounting, Finance, Hospitality and Tourism, Information Systems, Management, Marketing, and Operations), a Master's of Accounting (MAcc) and Master's of Business Administration (MBA). The PhD is a four year residential program available in Pullman, WA. The MAcc is available in Pullman and Vancouver, WA. The MBA is available in Pullman, Tri-Cities, Vancouver and online with an Executive option also available online.

Degree Description

Apply to the only AACSB-accredited, stakeholder-focused MBA program offered anywhere, and watch your career take off. Washington State University Vancouver's MBA program was honored among the Aspen Institute's "Beyond Grey Pinstripes Global 100" top alternative business schools in 2009 for its nationally recognized and respected faculty and globally relevant stakeholder focus.WSU Vancouver's MBA program integrates a stakeholder focus throughout all courses. You will come away with a clear understanding of the interdependence between a business and its stakeholders-employees, investors, customers, suppliers, and public constituencies. You will learn to apply theory to practice and adopt an executive-level perspective that empowers you to make decisions and take action.

Contact Information

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ACCTG

533 **Administrative Control** 3 Prereq enrollment in the MBA program. Managerial evaluation of budgeting, cost accounting, and financial analysis techniques; their utilization in control of operations.

Business Administration

B A

520 **Resources, Stakeholders and Competitive Advantage** 3 Prereq admission to the MBA program. Creating competitive advantage using resources provided by key stakeholders.

Business Administration

FIN

526 Problems in Financial Management 3 Prereq enrollment in the MBA program; Fin 325 or 525. Application of financial principles to problems in financial management; credit policy, capital budgeting, leasing and mergers, cash management.

Management

MGMT

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Management

MGTOP

585 Negotiation Skills 3 Graduate counterpart of MgtOp 485; additional requirements. Credit not granted for both MgtOp 485 and 585.

587 Professional Ethics and Practice in Business 3 Prereq MgtOp 451 or 591. Ethical issues faced by businesses in the current environment; traditional sources for discerning professional and ethical practices.

589 Seminar in Management 3 May be repeated for credit; cumulative maximum 6 hours. Prereq admission to MBA program. Special topics in management, organization behavior, organization theory, human resource management and strategic management.

590 Strategy Formulation and Organizational Design 3 Prereq enrollment in the MBA program. Relationship between the formulation of strategy and the selection of effective organizational structures and systems.

591 Statistical Analysis for Business Decisions 3 Prereq enrollment in the MBA program. Analytical skills for decision-making; data collection and analysis, sampling, inferential, regression methodologies, experimental design, time series, forecasting analysis.

593 Managerial Leadership and Productivity 3 Prereq enrollment in the MBA program. Organizational behavior and human motivation in the workplace; organization and leadership theories, studies, projects and models leading to improved productivity.

Management Information Systems

MIS

580 Information Systems Management 3 Prereq enrollment in the MBA program. Data processing organization; operations, application development, computer selection, management of computer personnel and systems.

Management Information Systems

MKTG

506 Marketing Management and Administrative Policy 3 Prereq enrollment in the MBA program. Marketing management and administrative policies as they relate to concepts, strategies, and decision making.

Business Administration - MBA-Executive (Online)

Degree offered: Master of Business Administration

Faculty working with graduate students: 13

Graduate students: 25

Program offered: DDP, DDP

Tests required: GMAT, IELTS, MELAB, Pearson, TOEFL, TOEFLI

Deadline: Fall: August 8
Spring: December 13
Summer: April 25
Fall: August 6

Requirements

Students will complete a unique, viable business plan as their final project.

Program Description

Graduate Programs in the College of Business at Washington State University consist of a PhD in Business Administration with 7 areas of concentration (Accounting, Finance, Hospitality and Tourism, Information Systems, Management, Marketing, and Operations), a Master's of Accounting (MAcc) and Master's of Business Administration (MBA). The PhD is a four year residential program available in Pullman, WA. The MAcc is available in Pullman and Vancouver, WA. The MBA is available in Pullman, Tri-Cities, Vancouver and online with an Executive option also available online.

Contact Information

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Faculty

Jonathan Arthurs, Joseph Cote, Joseph Harris, Kshiti Joshi, Velle Kolde, John Nofsinger, Fredrick Peterson, Jerman Rose, Raul Sanchez, Saonee Sarker, David Sprott, Uchila Umesh and Jeanne Yamamura.

ACCTG

533 Administrative Control 3 Prereq enrollment in the MBA program. Managerial evaluation of budgeting, cost accounting, and financial analysis techniques; their utilization in control of operations.

Business Administration

B A

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Business Administration

ENTRP

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

Business Administration

FIN

526 Problems in Financial Management 3 Prereq enrollment in the MBA program; Fin 325 or 525. Application of financial principles to problems in financial management; credit policy, capital budgeting, leasing and mergers, cash management.

Business Administration

I BUS

580 International Business Management 3 Decision making in the international environment; political, cultural, and economic risk management.

600 Special Projects or Independent Study V 1-18 May be repeated for credit.

Business Administration

MGTOP

587 Professional Ethics and Practice in Business 3 Prereq MgtOp 451 or 591. Ethical issues faced by businesses in the current environment; traditional sources for discerning professional and ethical practices.

588 Management of Innovation 3 Prereq Graduate standing. Technological transitions and technology strategy; knowledge and creativity in organizations; managing innovation processes, technical employees, and cross-functional cooperation.

590 Strategy Formulation and Organizational Design 3 Prereq enrollment in the MBA program. Relationship between the formulation of strategy and the selection of effective organizational structures and systems.

591 Statistical Analysis for Business Decisions 3 Prereq enrollment in the MBA program. Analytical skills for decision-making; data collection and analysis, sampling, inferential, regression methodologies, experimental design, time series, forecasting analysis.

593 Managerial Leadership and Productivity 3 Prereq enrollment in the MBA program. Organizational behavior and human motivation in the workplace; organization and leadership theories, studies, projects and models leading to improved productivity.

Management Information Systems

MIS

572 Database Management Systems 3 Prereq admission to MBA program. Database management, data modeling, system design and implementation; the application of DBMS technologies to organizational and business problems.

Management Information Systems

MKTG

506 Marketing Management and Administrative Policy 3 Prereq enrollment in the MBA program. Marketing management and administrative policies as they relate to concepts, strategies, and decision making.

Business Administration - Operations

Degree offered: Doctor of Philosophy

Faculty working with graduate students: 4

Graduate students: 8

Graduate students receiving assistantships or scholarships: 87%

Tests required: GMAT, IELTS, MELAB, Pearson, TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

Research Tool Requirements include 12 hours. 30 additional required hours in major and minor fields. 1-credit professional development seminar. 24-credit requirement for Ph.D. research. Students are required to pass a qualifying exam. The exam is typically taken in June after the first year of study. Only one retake is allowed, typically in the subsequent August.

Program Description

Graduate Programs in the College of Business at Washington State University consist of a PhD in Business Administration with 7 areas of concentration (Accounting, Finance, Hospitality and Tourism, Information Systems, Management, Marketing, and Operations), a Master's of Accounting (MAcc) and Master's of Business Administration (MBA). The PhD is a four year residential program available in Pullman, WA. The MAcc is available in Pullman and Vancouver, WA. The MBA is available in Pullman, Tri-Cities, Vancouver and online with an Executive option also available online.

Degree Description

The program in Operations and Decision Sciences prepares students for careers in business, industry, or government using expertise garnered in applied problem solving and data analysis. Students receive rigorous fundamental training in statistics, research methods, mathematics, and operations research, followed by theoretical study within their respective fields of interest. All students are expected to produce publishable research for peer-reviewed journals prior to graduation.

Training and Professional Development Opportunities

Six Sigma Green Belt and Six Sigma Black Belt

Post-Graduate Employment Opportunities

University Professor;Management Science Analyst;Statistician

Post-Graduate Career Placements

American University of Sharjah--UAE; Central Washington University; Chapman University; Ching-Yi University--China; Fort Hays State University; Grand Valley State University; KeiMyung University; Marquette University; Microsoft Corporation; Min Chuan University; National Renewable Energy Lab; Northeastern University; Oregon State University; Southeastern Oklahoma State University; Southwestern University of Finance and Economices--China; State University of New York--Geneseo; Tatung Institute of Technology; University of Kansas; University of Michigan--Flint; University of North Texas; University of Tennessee--Martin; University of Washington

Contact Information

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Faculty

Sung Ahn, Timothy Baker, Stergios Fotopoulos and Charles Munson.

Business Administration

B A

598 Research and Professional Development 1 May be repeated for credit; cumulative maximum 6 hours. Ph.D.-level professional development colloquium designed to improve research, teaching, and presentation skills and to provide professional socialization.

Business Administration

MATH

464 Linear Optimization 3 Prereq Math 273. Linear and integer programming; optimization problems; applications to economic and military strategies; rectangular games; minimax theory.

516 Simulation Methods 3 Prereq Math 360 and a computer programming course. Graduate-level counterpart of Math 416; additional requirements. Credit not granted for both Math 416 and 516.

Business Administration

MGTOP

596 Doctoral Topics V 1-4 May be repeated for credit; cumulative maximum 15 hours. Advanced topics in management and operations.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Business Administration

STAT

443 Applied Probability 3 Prereq Math 172; 220. Axioms of probability theory; random variables; expectation; generating function; law of large numbers; central limit theorem; Markov chains.

556 Introduction to Statistical Theory 3 Prereq Stat 430 or 443; graduate standing. Graduate-level counterpart of Stat 456; additional requirements. Credit not granted for both Stat 456 and 556.

Chemical Engineering

Degree offered: Doctor of Philosophy (Chemical Engineering)

Faculty working with graduate students: 18

Graduate students: 40

Graduate students receiving assistantships or scholarships: 90%

Program offered: Pullman, Tri-Cities

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Program Description

Through the Voiland School, students may earn either a Master of Science (MS) or a Doctor of Philosophy (PhD) in Chemical Engineering. Within the Chemical Engineering Program we specialize in the development of sustainable energy solutions, understanding environmental systems, and developing systems and devices to improve the health of individuals everywhere. Students may receive chemical engineering degrees working with faculty in Pullman or on the TriCities campus.

Degree Description

Faculty research is broadly focused in three synergistic areas: Sustainable Energy Systems, Bimolecular Engineering, and Biomechanics. Within these areas, projects are focused on:â– chemical and biological catalysis and kinetics;â– chemical and biological fuel cells;â– biofilm engineering;â– novel sensor technologies;â– cardiac and reproductive molecular engineering;â– and molecular, cellular, and musculskeletal mechanics.Specialized equipment includes a dynamic x-ray diffractometer, a colloidal characterization lab with field scattering capabilities, large scale fermentors, GC, LC, LC/MS chromatographic systems, and Atomic Force and other optical microscopes. The graduate programs are flexible, allowing students to develop a program that fits individual needs. A master of science is typically completed in 12-15 months, and a doctorate in 3-4 years after completion of the bachelor of science degree. Many doctoral students also participate in training programs, such as the NIH-sponsored protein biotechnology training program.

Training and Professional Development Opportunities

The Voiland School offers excellent research facilities, the flexibility to design an individualized academic program, and the ability to work closly with highly engaged faculty. We also offer students the opportunity to participate in an NIH (National Institutes of Health) sponsored training program in protein Biochemistry, and we encourage students to participate in internship programs at partner institutions.

Contact Information

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Faculty

Nehal Abu-Lail, Birgitte Ahring, Haluk Beyenal, Denny Davis, Howard Davis, Wenji Dong, Feng Gao, Su Ha, Cornelius Ivory, Knona Liddell, David Lin, Edward Pate, James Petersen, Bernard Vanwie, Anita Vasavada, Yong Wang, Xiao Zhang and Richard Zollars.

CH E

510 Transport Processes 3 Transport of mass, energy, and momentum; unsteady and steady states as applied to chemical processing; macroscopic and microscopic analyses.

529 Chemical Engineering Kinetics 3 Interpretation of kinetic data and design of nonideal chemical reactors; fundamentals of heterogeneous catalysis, catalyst preparation, characterization, and theory.

541 Chemical Engineering Analysis 3 Mathematical analysis of chemical engineering operations and processes; mathematical modeling and computer application.

560 Biochemical Engineering 3 Chemical engineering applied to biological systems; fermentation processes, biochemical reactor design, downstream processing, transport phenomena in biological systems, biochemical technology.

596 Research Methods and Presentation I 2 Prereq graduate standing. Establish sound practices for graduate research and presentation of results; techniques used for performing through literature searching and establishing and testing research hypotheses.

597 Research Methods and Presentation II 2 Prereq graduate standing. Establishing sound practices for presentation of research programs and research results.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Chemical Engineering

Degree offered: Master of Science in Chemical Engineering

Faculty working with graduate students: 18

Graduate students: 4

Graduate students receiving assistantships or scholarships: 100%

Program offered: Pullman, Tri-Cities

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Program Description

Through the Voiland School, students may earn either a Master of Science (MS) or a Doctor of Philosophy (PhD) in Chemical Engineering. Within the Chemical Engineering Program we specialize in the development of sustainable energy solutions, understanding environmental systems, and developing systems and devices to improve the health of individuals everywhere. Students may receive chemical engineering degrees working with faculty in Pullman or on the TriCities campus.

Degree Description

Faculty research is broadly focused in three areas: sustainable energy systems, biomolecular engineering, and biomechanics. Within these areas projects are focused on chemical and biological catalysis and kinetics; chemical and biological fuel cells; biofilm engineering; novel sensor technologies; cardiac and reproductive molecular engineering; and molecular, cellular, and musculoskeletal mechanics. The graduate programs are flexible, allowing students to develop a program that fits individual needs. A Master of Science is typically completed in 12-15 months.

Training and Professional Development Opportunities

The Voiland School offers excellent research facilities, the flexibility to design an individualized academic program, and the ability to work closly with highly engaged faculty. We also offer students the opportunity to participate in an NIH (National Institutes of Health) sponsored training program in protein Biochemistry, and we encourage students to participate in internship programs at partner institutions.

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Faculty

Nehal Abu-Lail, Birgitte Ahring, Haluk Beyenal, Denny Davis, Howard Davis, Wenji Dong, Feng Gao, Su Ha, Cornelius Ivory, Knona Liddell, David Lin, Edward Pate, James Petersen, Bernard Vanwie, Anita Vasavada, Yong Wang, Xiao Zhang and Richard Zollars.

CH E

510 **Transport Processes** 3 Transport of mass, energy, and momentum; unsteady and steady states as applied to chemical processing; macroscopic and microscopic analyses.

541 **Chemical Engineering Analysis** 3 Mathematical analysis of chemical engineering operations and processes; mathematical modeling and computer application.

596 **Research Methods and Presentation I** 2 Prereq graduate standing. Establish sound practices for graduate research and presentation of results; techniques used for performing through literature searching and establishing and testing research hypotheses.

597 **Research Methods and Presentation II** 2 Prereq graduate standing. Establishing sound practices for presentation of research programs and research results.

700 **Master's Research, Thesis, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

Chemical Engineering

Degree offered: Master of Science in Chemical Engineering - Non Thesis

Faculty working with graduate students: 18

Program offered: Pullman, Tri-Cities

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Program Description

Through the Voiland School, students may earn either a Master of Science (MS) or a Doctor of Philosophy (PhD) in Chemical Engineering. Within the Chemical Engineering Program we specialize in the development of sustainable energy solutions, understanding environmental systems, and developing systems and devices to improve the health of individuals everywhere. Students may receive chemical engineering degrees working with faculty in Pullman or on the TriCities campus.

Degree Description

Faculty research is broadly focused in three areas: sustainable energy systems, biomolecular engineering, and biomechanics. Within these areas projects are focused on chemical and biological catalysis and kinetics; chemical and biological fuel cells; biofilm engineering; novel sensor technologies; cardiac and reproductive molecular engineering; and molecular, cellular, and musculoskeletal mechanics. The graduate programs are flexible, allowing students to develop a program that fits individual needs. A Master of Science is typically completed in 12-15 months.

Post-Graduate Employment Opportunities

Graduates may participate in the design and production of chemically based products or they may engage in research leading to new or improved chemical products, products, and uses. Graduates find rewarding work in plant operation, plant management, university teaching, sales/service, and other functions requiring chemical engineering training. Many students also use their education in chemical engineering as preparation for other professional degrees such as medicine or law.

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CH E

510 **Transport Processes** 3 Transport of mass, energy, and momentum; unsteady and steady states as applied to chemical processing; macroscopic and microscopic analyses.

541 **Chemical Engineering Analysis** 3 Mathematical analysis of chemical engineering operations and processes; mathematical modeling and computer application.

596 **Research Methods and Presentation I** 2 Prereq graduate standing. Establish sound practices for graduate research and presentation of results; techniques used for performing through literature searching and establishing and testing research hypotheses.

597 **Research Methods and Presentation II** 2 Prereq graduate standing. Establishing sound practices for presentation of research programs and research results.

702 **Master's Special Problems, Directed Study, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

Chemistry

Degree offered: Doctor of Philosophy (Chemistry)

Faculty working with graduate students: 28

Graduate students: 88

Graduate students receiving assistantships or scholarships: 98%

Tests required: GRE (Combined), TOEFL

Deadline: Fall: March 1 (January 15 international)
Spring: October 1

Program Description

The Department of Chemistry offers courses of study leading to the MS and PhD degrees with opportunities for research in seven fields: analytical, environmental, radiochemistry, materials chemistry, inorganic, organic and bioorganic, and physical chemistry. The low student-to-faculty ratio assures students of individual guidance, yet the total size of the department provides excellent facilities for research, including the latest instrumentation.The program of study for graduate students in the Department of Chemistry provides a good balance between formal course work and research experience. In addition to the normal core classes, first-year graduate students also take a seminar course which provides a forum for the presentation and discussion of current research in chemistry within the department. With this exposure, students are typically comfortable selecting a research adviser by the end of their first semester. Individual divisions also have a weekly seminar program in which graduate students participate, gaining experience in presenting and discussing their own research.

Degree Description

The written PhD thesis is the capstone of your graduate career and will describe a significant body of original scientific research. The adequacy of this work will be judged by your research advisor and committee members as well as the entire graduate faculty. Most successful PhD candidates are already the first author on several papers by the time they reach this stage of their career. Though there is no set number of publications required for completion of the PhD, a typical thesis will be the equivalent of at least two journal articles, with additional introductory material and experimental detail.

Training and Professional Development Opportunities

Divisional seminars within the department, participation in regional and national meetings

Post-Graduate Employment Opportunities

Some of our alumni are heads of international corporations and faculty members in Chemistry Departments around the country.

Post-Graduate Career Placements

Many of our graduates have gotten jobs in the state crime lab, teaching positions and in many industries.

Contact Information

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Faculty

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CHEM

501 Advanced Inorganic Chemistry I 3 Periodic table survey, typical compounds and their reactivity; models and reactivity, acid-base, oxidation-reduction, and electronic structure contributions.

503 Advanced Topics in Inorganic Chemistry V 1-3 May be repeated for credit. Recent significant developments.

509 Chemical Group Theory 3 Mathematical definitions of groups and representations, applications to chemical structure and spectra, ligand field theory, chemical reactions and selection rules.

510 Introduction to Proteomics 2 Prereq graduate standing or permission of the instructor; introductory biochemistry, MBioS 303 or equivalent. Techniques and applications for the analysis of the proteome.

512 Bioanalysis 2 Methods for the measurement of biological compounds.

514 Mass Spectrometry 2 Prereq Chem 425. Current methods, techniques and interpretation of mass spectrometric analysis.

517 Chromatography 2 Prereq Chem 425.

518 Electrochemistry 2 Prereq Chem 425.

520 Advanced Analytical Chemistry 3 Prereq Chem 425. Statistics in chemical analysis; sampling; control of contamination and losses in analysis; electrochemical methods; separation in analysis; spectroscopic techniques.

521 Radiochemistry and Radiotracers 2 Prereq Chem 331 with a grade of C or better. Graduate-level counterpart of Chem 421; additional requirements. Credit not granted for both Chem 421 and 521.

522 Radiochemistry Laboratory 1 (0-3) Prereq Chem 222, 331; Phys 202 each with a grade of C or better. Graduate-level counterpart of Chem 422; additional requirements. Credit not granted for both Chem 422 and 522.

527 Environmental Chemistry 2 Natural water chemistry, Agri processes, kinetics, thermodynamics, modeling in lake, river, and sea water.

529 Selected Topics in Analytical Chemistry V 1-3 May be repeated for credit. Selected current developments.

531 Advanced Physical Chemistry I 3 Prereq Chem 331. Classical physical chemistry including basic thermodynamics and kinetics; an introductory discussion of surface chemistry and electrochemistry.

532 Advanced Physical Chemistry II 3 Prereq Chem 332. Introduction to quantum mechanics; postulates of quantum mechanics; exact solutions and approximation methods.

534 Chemical Statistical Mechanics 3 Statistical theory of thermodynamic variables and chemical equilibrium; calculation of equilibrium properties from spectral data; fluctuations about equilibrium; quantum statistics.

536 Quantum Chemistry 3 Prereq Chem 532 or equivalent. Quantum mechanics applied to chemical problems: states of atoms and molecules, transitions and spectra, ladder operators and many electron methods.

537 Advanced Topics in Physical Chemistry V 1-3 May be repeated for credit. Selected subjects; irreversible thermodynamics; chemical bonding; NMR; ligand field theory; x-ray diffraction; neutron diffraction.

540 Physical Organic Chemistry 3 The major classes of organic reaction mechanisms and their significance; kinetics and introductory theory.

542 Advanced Organic Chemistry 3 Synthesis of organic compounds; recent developments from current literature.

543 Bioorganic Chemistry 3 Chemistry of biological systems, medicinal chemistry, protein chemistry, enzyme mechanisms and inhibitors.

544 Advanced Topics in Organic Chemistry V 1-3 May be repeated for credit. Current research in organic chemistry.

545 Synthetic Organic Chemistry 3 Modern synthetic methods and strategies; detailed reaction mechanisms, reaction scope and issues in catalysis will be discussed.

546 Spectroscopic Identification of Organic Compounds 3 Structural interpretation of mass spectrometry and IR, UV-VIS and NMR spectrometry of small molecule organic compounds.

550 Special Topics in Nuclear Processes and Radioactive Waste Management V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq permission of instructor. Fundamental chemistry of the nuclear industry, chemical processing and waste management.

555 Teaching Chemistry 1 Teaching chemistry; workshops for new graduate teaching assistants in chemistry focusing on tutorials and labs.

564 Molecular Phenomena 3 Phenomena which yield information on structures, energy levels, and interactions of molecules in solid, liquid, and gaseous phases.

581 Environmental Chemistry I 3 Prereq graduate standing. Chemistry of natural and pollutant species and their reactions in the atmospheric environment.

590 Introduction to Research Topics 1 Presentation and description of research areas and projects of current interest to faculty.

592 Seminar in Analytical Chemistry 1 May be repeated for credit; cumulative maximum 6 hours. Presentation and discussion of topics in analytical chemistry taken from research in progress or current literature.

593 Seminar in Physical Chemistry 1 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing. Presentation and discussion of topics in physical chemistry and materials science taken from research in progress or current literature.

594 Seminar in Organic Chemistry 1 May be repeated for credit; cumulative maximum 6 hours. Presentation and discussion of topics in organic chemistry taken from research in progress or current literature.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Chemistry

Degree offered: Master of Science in Chemistry

Faculty working with graduate students: 28

Graduate students: 4

Graduate students receiving assistantships or scholarships: 100%

Program offered: Pullman, Tri-Cities

Tests required: GRE (Combined), TOEFL

Deadline: Fall: March 1 (January 15 international)
Spring: October 1

Program Description

The Department of Chemistry offers courses of study leading to the MS and PhD degrees with opportunities for research in seven fields: analytical, environmental, radiochemistry, materials chemistry, inorganic, organic and bioorganic, and physical chemistry. The low student-to-faculty ratio assures students of individual guidance, yet the total size of the department provides excellent facilities for research, including the latest instrumentation.The program of study for graduate students in the Department of Chemistry provides a good balance between formal course work and research experience. In addition to the normal core classes, first-year graduate students also take a seminar course which provides a forum for the presentation and discussion of current research in chemistry within the department. With this exposure, students are typically comfortable selecting a research adviser by the end of their first semester. Individual divisions also have a weekly seminar program in which graduate students participate, gaining experience in presenting and discussing their own research.

Degree Description

While the WSU Chemistry graduate program emphasizes the Ph.D. degree, we appreciate that there are circumstances which favor awarding of the M.S. degree. The degree of Master of Science is awarded in recognition of scholarship and contributions to knowledge in the field of Chemistry. The Master's Degree is based on research carried out in the laboratories of the Department and allows students to gain experience in modern experimental techniques and to familiarize themselves with the daily workings of a laboratory. Master's Degree students (on either the thesis or non-thesis track) must carry out a research project under the supervision of a member of the Chemistry Department faculty. Master's students are expected to participate fully in the scientific life of the Department and to attend the various meetings and seminars that take place.

Contact Information

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Faculty

Paul Benny, Clifford Berkman, James Brozik, Aurora Clark, Sue Clark, Gregory Crouch, Philip Garner, Herbert Hill, Kerry Hipps, James Hurst, Jeffrey Jones, Chulhee Kang, Jeremy Lessmann, Alexander Li, Donald Matteson, Ursula Mazur, Jeanne McHale, Ken Nash, Kirk Peterson, Peter Reilly, Robert Ronald, James Satterlee, James Schenk, Louis Scudiero, Nathalie Wall, Scot Wherland, Ming Xian and Choong-Shik Yoo.

CHEM

501 Advanced Inorganic Chemistry I 3 Periodic table survey, typical compounds and their reactivity; models and reactivity, acid-base, oxidation-reduction, and electronic structure contributions.

503 Advanced Topics in Inorganic Chemistry V 1-3 May be repeated for credit. Recent significant developments.

509 Chemical Group Theory 3 Mathematical definitions of groups and representations, applications to chemical structure and spectra, ligand field theory, chemical reactions and selection rules.

510 Introduction to Proteomics 2 Prereq graduate standing or permission of the instructor; introductory biochemistry, MBioS 303 or equivalent. Techniques and applications for the analysis of the proteome.

512 Bioanalysis 2 Methods for the measurement of biological compounds.

514 Mass Spectrometry 2 Prereq Chem 425. Current methods, techniques and interpretation of mass spectrometric analysis.

517 Chromatography 2 Prereq Chem 425.

518 Electrochemistry 2 Prereq Chem 425.

520 Advanced Analytical Chemistry 3 Prereq Chem 425. Statistics in chemical analysis; sampling; control of contamination and losses in analysis; electrochemical methods; separation in analysis; spectroscopic techniques.

521 Radiochemistry and Radiotracers 2 Prereq Chem 331 with a grade of C or better. Graduate-level counterpart of Chem 421; additional requirements. Credit not granted for both Chem 421 and 521.

522 Radiochemistry Laboratory 1 (0-3) Prereq Chem 222, 331; Phys 202 each with a grade of C or better. Graduate-level counterpart of Chem 422; additional requirements. Credit not granted for both Chem 422 and 522.

527 Environmental Chemistry 2 Natural water chemistry, Agri processes, kinetics, thermodynamics, modeling in lake, river, and sea water.

529 Selected Topics in Analytical Chemistry V 1-3 May be repeated for credit. Selected current developments.

531 Advanced Physical Chemistry I 3 Prereq Chem 331. Classical physical chemistry including basic thermodynamics and kinetics; an introductory discussion of surface chemistry and electrochemistry.

532 Advanced Physical Chemistry II 3 Prereq Chem 332. Introduction to quantum mechanics; postulates of quantum mechanics; exact solutions and approximation methods.

534 Chemical Statistical Mechanics 3 Statistical theory of thermodynamic variables and chemical equilibrium; calculation of equilibrium properties from spectral data; fluctuations about equilibrium; quantum statistics.

536 Quantum Chemistry 3 Prereq Chem 532 or equivalent. Quantum mechanics applied to chemical problems: states of atoms and molecules, transitions and spectra, ladder operators and many electron methods.

537 Advanced Topics in Physical Chemistry V 1-3 May be repeated for credit. Selected subjects; irreversible thermodynamics; chemical bonding; NMR; ligand field theory; x-ray diffraction; neutron diffraction.

540 Physical Organic Chemistry 3 The major classes of organic reaction mechanisms and their significance; kinetics and introductory theory.

542 Advanced Organic Chemistry 3 Synthesis of organic compounds; recent developments from current literature.

543 Bioorganic Chemistry 3 Chemistry of biological systems, medicinal chemistry, protein chemistry, enzyme mechanisms and inhibitors.

544 Advanced Topics in Organic Chemistry V 1-3 May be repeated for credit. Current research in organic chemistry.

545 Synthetic Organic Chemistry 3 Modern synthetic methods and strategies; detailed reaction mechanisms, reaction scope and issues in catalysis will be discussed.

546 Spectroscopic Identification of Organic Compounds 3 Structural interpretation of mass spectrometry and IR, UV-VIS and NMR spectrometry of small molecule organic compounds.

550 Special Topics in Nuclear Processes and Radioactive Waste Management V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq permission of instructor. Fundamental chemistry of the nuclear industry, chemical processing and waste management.

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702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Civil Engineering

Degree offered: Doctor of Philosophy (Civil Engineering)

Faculty working with graduate students: 32

Graduate students: 35

Graduate students receiving assistantships or scholarships: 88%

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Program Description

The graduate programs in Civil Engineering are offered leading to the Master of Science in Civil Engineering degree, the Master of Science in Environmental Engineering degree, and the Doctor of Philosophy Civil Engineering degree. The department also participates in university programs leading to the M.S. in Environmental Science and the Ph.D. in Engineering Science. At the Master's level, specific programs are available within each area.

Degree Description

Students may be accepted into the graduate program with undergraduate degrees in other than Civil Engineering (e.g., related areas such as mechanical engineering, materials science, physics, etc.). These students, however, may need to complete additional courses to cover deficiencies. Courses taken to satisfy deficiencies cannot be included in the program of study. Each student, in consultation with his/her graduate committee, will develop a plan of study. This plan outlines what courses will be required for completion of the degree. To develop a plan of study, students may choose from a variety of graduate and selected undergraduate courses offered in the area of emphasis. In addition, courses may be selected from a number of related courses in other programs in the Department of Civil and Environmental Engineering, as well as in other departments of the University. The doctorate program is individually tailored to each student's need and interest.

Training and Professional Development Opportunities

Opportunities for National Lab internships, federal agency policy analysis internship, or an opportunity to do development work exist on a case-by-case basis.

Post-Graduate Employment Opportunities

Faculty positions, Consulting positions, National Research Lab appointments

Post-Graduate Career Placements

Muliple faculty positions in the US and overseas.Research Lab assignmentsConsultants in premier Civil Engineering firms in the US and overseas.

Contact Information

Dr. Balasingam Muhunthan
Graduate Committee Chair

Vicki Ruddick
Graduate Coordinator

Faculty

Jennifer Adam, Michael Barber, Donald Bender, Marc Beutel, Shane Brown, Phillip Butterfield, Serena Chung, Candis Claiborn, William Cofer, James Dolan, Karl Englund, Liv Haselbach, Md Hossain, B Jobson, Brian Lamb, Fok-Yan Leung, Heping Liu, David McLean, George Mount, Balasingam Muhunthan, David Pollock, Shelley Pressley, Pizhong Qiao, Shihui Shen, Timothy Vanreken, Joseph Vaughan, Richard Watts, Haifang Wen, Michael Wolcott, Vikram Yadama, David Yonge and Jinwen Zhang.

Civil Engineering

Degree offered: Master of Science in Civil Engineering

Faculty working with graduate students: 32

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Program Description

The graduate programs in Civil Engineering are offered leading to the Master of Science in Civil Engineering degree, the Master of Science in Environmental Engineering degree, and the Doctor of Philosophy Civil Engineering degree. The department also participates in university programs leading to the M.S. in Environmental Science and the Ph.D. in Engineering Science. At the Master's level, specific programs are available within each area.

Degree Description

Students may be accepted into the graduate program with undergraduate degrees in other than Civil Engineering (e.g., related areas such as mechanical engineering, materials science, physics, etc.). These students, however, may need to complete additional courses to cover deficiencies. Courses taken to satisfy deficiencies cannot be included in the program of study. Each student, in consultation with his/her graduate committee, will develop a plan of study. This plan outlines what courses will be required for completion of the degree. To develop a plan of study, students may choose from a variety of graduate and selected undergraduate courses offered in the area of emphasis. In addition, courses may be selected from a number of related courses in other programs in the Department of Civil and Environmental Engineering, as well as in other departments of the University.

Training and Professional Development Opportunities

Opportunities to participate as National Lab internships, federal agency policy analysis internship, or an opportunity to do development work exist on a case-by-case basis.

Post-Graduate Employment Opportunities

ConsultingReserach labsFederal state agencies.

Post-Graduate Career Placements

ConsultingReserach labsFederal state agencies.

Contact Information

Dr. Balasingam Muhunthan
Graduate Committee Chair

Vicki Ruddick
Graduate Coordinator

Faculty

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Civil Engineering

Degree offered: Master of Science in Civil Engineering - Non Thesis

Faculty working with graduate students: 32

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Program Description

The graduate programs in Civil Engineering are offered leading to the Master of Science in Civil Engineering degree, the Master of Science in Environmental Engineering degree, and the Doctor of Philosophy Civil Engineering degree. The department also participates in university programs leading to the M.S. in Environmental Science and the Ph.D. in Engineering Science. At the Master's level, specific programs are available within each area.

Degree Description

Students may be accepted for this degree with undergraduate degrees in other than Civil Engineering (e.g., related areas such as mechanical engineering, materials science, physics, etc.). These students, however, may need to complete additional courses to cover deficiencies. Courses taken to satisfy deficiencies cannot be included in the program of study. The students doing the non-thesis option either take courses only with a final oral exam or a project option (with no thesis). The graded course work requirements vary as specified in the graduate handbook of Civil Engineering.

Contact Information

Balasingam Muhunthan
Graduate Committee Chair
www.ce.wsu.edu/Grads/ceGradProg.htm

Faculty

Jennifer Adam, Michael Barber, Donald Bender, Marc Beutel, Shane Brown, Phillip Butterfield, Serena Chung, Candis Claiborn, William Cofer, James Dolan, Karl Englund, Liv Haselbach, Md Hossain, B Jobson, Brian Lamb, Fok-Yan Leung, Heping Liu, David McLean, George Mount, Balasingam Muhunthan, David Pollock, Shelley Pressley, Pizhong Qiao, Shihui Shen, Timothy Vanreken, Joseph Vaughan, Richard Watts, Haifang Wen, Michael Wolcott, Vikram Yadama, David Yonge and Jinwen Zhang.

Communication

Degree offered: Doctor of Philosophy (Communication)

Faculty working with graduate students: 17

Graduate students: 24

Graduate students receiving assistantships or scholarships: 87%

Tests required: GRE (Quantitative), GRE (Verbal), TOEFL, TOEFLI

Deadline: Fall: December 31

Requirements

In addition to the core courses (15 credits), students must complete 6-12 credits of research methods, 15 or more credits in a major concentration area, 9 or more credits in a supporting academic area, and 21-30 dissertation credits.Additional information about the degree requirements can be found on the college web site: http://www.communication.wsu.edu/gradstudies/doctoral/docprogreq.htm

Program Description

The Edward R. Murrow College of Communication's master's and doctorate programs provide flexible study in communication studies in a research-based curriculum. Areas of concentration include media, health and social issues, organizations and culture. Students develop unique programs of study in consultation with lead faculty. Criteria for study are based on individual academic interests. The Murrow College is nationally and internationally recognized for its excellence in scholarship and faculty-student interaction. As one of few colleges in the country that incorporates communication

studies and mass communication, the Murrow Program provides graduate students the opportunity to work closely with diverse faculty whose research is far-reaching. Students of The Edward R. Murrow College of Communication will graduate with a thorough understanding of theoretical and practical issues related to their chosen concentration along with opportunities to learn from industry leaders. Graduates are prepared for careers in teaching, research, and public service. Potential employers include colleges and universities, private industry, and governmental agencies.

Degree Description

The Edward R. Murrow College of Communication is nationally and internationally recognized for its excellence in scholarship and close faculty-student interaction. As one of few colleges in the country incorporating communication studies and mass communication, the Murrow Program provides graduate students the opportunity to work closely with faculty from a wide range of disciplines. With multiple nationally-ranked programs of study, The Murrow College's Graduate Program provides students the opportunity to take classes and perform research with leading scholars. Our students consistently present papers at regional, national, and international conferences, and frequently publish articles with faculty.

Post-Graduate Employment Opportunities

Graduates of The Edward R. Murrow College of Communication graduate program are prepared for careers in teaching, research, and public service. Potential employers of program graduates include colleges and universities, private industry, and governmental agencies.

Post-Graduate Career Placements

Associate Professor at University of Arizona, Assistant Professor at Ohio University, Assistant Professor, Virginia Tech, Instruction Design Coordinator, Assistant Professor at Oregon State University, Instructor at City University, Associate Professor at Zhejiang University

Contact Information

Graduate Coordinator
Student Services
The Edward R. Murrow College of Communication
Murrow East 226, PO Box 642520
Pullman, WA 99164-2520
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E-mail: grad.communication@wsu.edu

Faculty

Erica Austin, Frederick Busselle, Prabu David, David Demers, Jolanta Drzewiecka, Douglas Hindman, Elizabeth Hindman, Stacey Hust, E James, Todd Norton, Jeffery Peterson, Bruce Pinkleton, Lawrence Pintak, Michael Salvador, Patricia Sias, Alexis Tan and Changmin Yan.

COM

500 Introduction to Graduate Study 1 Prereq Graduate Standing, Permission of Instructor. Introduces graduate students to the pragmatics of graduate education and to research being conducted in the School of Communication.

501 Theory Building in Communication 3 Prereq graduate standing. Relationship of research to theory development; evaluation of current theory and research; planning and executing research within specified theoretical frameworks.

504 Instructional Practicum 1 May be repeated for credit; cumulative maximum 4 hours. Prereq graduate standing; by interview only.

506 Persuasion and Social Influence 3 Prereq graduate standing. Theories, concepts strategies and processes of persuasion and social influence.

507 Communication Ethics Seminar 3 Prereq graduate standing. Topics in communication ethics.

509 Quantitative Research 3 Prereq graduate standing. Introduction to quantitative research in communication; hypothesis development, testing; basic statistics, interpretation; field surveys, laboratory and field experiments, content analysis.

514 Health Communication Theories and Campaigns 3 Health communication theories with a focus on campaign construction and evaluation.

516 Health Communication and Society 3 3 Reviews, critiques and applications of research regarding the impact of social and cultural environments on health communication.

517 Health Communication and Social Development 3 Prereq graduate standing. Explores and tests role of mediated communication in the causes of and colutions for health problems, particularly among young people.

521 Foundational Perspectives in Intercultural Communication 3 Prereq graduate standing. Overview of three current foundational research perspectives in intercultural communication; functionalist (post-positivist), interpretive and critical.

522 Theoretical Perspectives on Intercultural Communication 3 Prereq graduate standing. Advanced readings in intercultural communication theory and methods; paradigms in current theorizing.

524 Intercultural/International Communication and Social Change 3 Prereq graduate standing. Application of communication theory, research and technologies aimed at fostering social change in intercultural and international contexts.

526 Current Topics in Intercultural Communication 3 Prereq graduate standing. Topics in current intercultural communication research.

535 Organizational Communication Theory 3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing. Traditional and emerging theories in organizational communication.

537 Organization and Society 3 Prereq graduate standing. Historical foundations, theoretical developments, contemporary issues and practical implications of communicative processes of organizations within society.

550 Media Processes and Effects: Theory and Practice 3 Physiological, psychological and social effects of media messages and technologies upon individuals and societies.

552 Current Issues in Media Processes and Effects 3 Prereq graduate standing. Current issues in media processes and effects.

570 Communication Theory 3 Prereq graduate standing. Relevant theories and research from mass and interpersonal communication.

571 Theoretical Perspectives on Media and Society 3 Prereq graduate standing. Theories explaining the social and cultural environments of communication processes emphasizing in mass communication.

572 Mass Media, Social Control, and Social Change 3 Prereq graduate standing. Study of the forces that influence the media's role as an agent of social control or social change.

573 Media and Public Discourse 3 Prereq graduate standing. Historical and contemporary concepts, questions and dynamics constituting the role of media and discourse among various publics.

580 Topics in Communication 3 May be repeated for credit; cumulative maximum 12 hours. Prereq graduate standing; by interview only. Contemporary, specialized, or technical topics in communication.

591 Qualitative Research Methods 3 Prereq graduate standing. Historical, textual, and legal methodologies for theory-based evaluative and discourse studies in communication.

599 Seminar in Communication 3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing; by interview only. Special topics in rhetoric, communication, and public address.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit. Prereq by interview only.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit. Prereq by interview only.

Communication

Degree offered: Master of Arts in Communication

Faculty working with graduate students: 17

Graduate students: 10

Graduate students receiving assistantships or scholarships: 80%

Tests required: GRE (Quantitative), GRE (Verbal), TOEFL, TOEFLI

Deadline: Fall: December 31
Spring: July 1

Requirements

In addition to the core courses (9 credits), students completing the Thesis Option must complete 18 credits of conceptual courses from inside and outside the college, and 4-6 thesis credits. In the final semester of a student's course work or after a student has successfully completed all required graded credit hours in the program, he or she must write and defend a prospectus. The purpose of the prospectus is to provide the student's committee members with a clear description of the proposed thesis, so that they may determine the soundness of preparation and conceptualization of the planned thesis. The actual format of the prospectus is developed in consultation with the student's committee chair.

Program Description

The Edward R. Murrow College of Communication's master's and doctorate programs provide flexible study in communication studies in a research-based curriculum. Areas of concentration include media, health and social issues, organizations and culture. Students develop unique programs of study in consultation with lead faculty. Criteria for study are based on individual academic interests. The Murrow College is nationally and internationally recognized for its excellence in scholarship and faculty-student interaction. As one of few colleges in the country that incorporates communication studies and mass communication, the Murrow Program provides graduate students the opportunity to work closely with diverse faculty whose research is far-reaching. Students of The Edward R. Murrow College of Communication will graduate with a thorough understanding of theoretical and practical issues related to their chosen concentration along with opportunities to learn from industry leaders. Graduates are prepared for careers in teaching, research, and public service. Potential employers include colleges and universities, private industry, and governmental agencies.

Degree Description

The M. A. in Communication at Washington State University is designed for individuals seeking higher-level and focused understanding of communication theory, processes and phenomena, whether their intent is to prepare for doctoral-level study in pursuit of an academic career or a communication-related career in business, government, education, research, or the communications industry. Successful completion of the program normally requires two academic years of full time study and results in the granting of the Master of Arts in Communication. Our program centers on:* Media, Health, & Social Issues focuses broadly on relations between media and the issues and problems that face society today, such as health, poverty, and crime. This includes social level analysis of mainstream and alternative media as products of and influences on society; individual level analysis of psychological and physiological processes through which knowledge, attitudes and behaviors are shaped; and the creation of messages related to health and social well-being, as well as how strategic messages campaigns are can influence decision making and social development.* Communication, Organizations, & Culture focuses on the role of communication in creating, maintaining and transforming socially collective groups ranging from for-profit businesses and corporations to non-profit community organizations and social movements. Because culture is central to social change and stasis, the study of intercultural communication is an integral scholarly component. Students focus on how meanings surrounding race, gender, ethnicity, and nationality are created and challenged through communicative practices.

Post-Graduate Employment Opportunities

Graduates of The Edward R. Murrow College of Communication graduate program are prepared for careers in teaching, research, and public service. Potential employers of program graduates include colleges and universities, private industry, and governmental agencies.

Post-Graduate Career Placements

Instructor, Southern Illinois University Carbondale; Pursuing doctoral degrees at Michigan State University and Arizona State University; Communication Coordinator in health industry; Doctoral Fellow at University of North Carolina, Chapel Hill; Non-Profit organizations; Account Manager at Consensus Inc.; Professional training coach; Assistant Professor; Assistant Director of Communication WSU Foundation; Event Planning Coordinator at Northwest Harvest; Faculty at La Trobe University; Director of Communication, WSU College of Nursing.

Contact Information

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PO Box 642520
Murrow East 226
Pullman, WA 99164-2520
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Faculty

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700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit. Prereq by interview only.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit. Prereq by interview only.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit. Prereq by interview only.

Communication

Degree offered: Master of Arts in Communication - Non Thesis

Faculty working with graduate students: 17

Tests required: GRE (Quantitative), GRE (Verbal), TOEFL, TOEFLI

Deadline: Fall: December 31
Spring: July 1

Requirements

In addition to the core courses (9 credits), students completing the Non-Thesis Option must complete 27 credits of conceptual courses from inside and outside the college, and 4 credits of Masters Thesis/Examination. Upon completion of the required course work, students will take the written comprehensive examination (6 hours). Upon successful completion of the written exam, the student's committee will schedule an oral examination. The examinations aim at the integration of the student's previous experience and study into consistent, mature understanding and expression suitable for advanced teaching, research, and writing in the chosen area of study.

Program Description

The Edward R. Murrow College of Communication's master's and doctorate programs provide flexible study in communication studies in a research-based curriculum. Areas of concentration include media, health and social issues, organizations and culture. Students develop unique programs of study in consultation with lead faculty. Criteria for study are based on individual academic interests. The Murrow College is nationally and internationally recognized for its excellence in scholarship and faculty-student interaction. As one of few colleges in the country that incorporates communication studies and mass communication, the Murrow Program provides graduate students the opportunity to work closely with diverse faculty whose research is far-reaching. Students of The Edward R. Murrow College of Communication will graduate with a thorough understanding of theoretical and practical issues related to

their chosen concentration along with opportunities to learn from industry leaders. Graduates are prepared for careers in teaching, research, and public service. Potential employers include colleges and universities, private industry, and governmental agencies.

Degree Description

The M. A. in Communication at Washington State University is designed for individuals seeking higher-level and focused understanding of communication theory, processes and phenomena, whether their intent is to prepare for doctoral-level study in pursuit of an academic career or a communication-related career in business, government, education, research, or the communications industry. Successful completion of the program normally requires two academic years of full time study and results in the granting of the Master of Arts in Communication. Our program centers on:* Media, Health, & Social Issues focuses broadly on relations between media and the issues and problems that face society today, such as health, poverty, and crime. This includes social level analysis of mainstream and alternative media as products of and influences on society; individual level analysis of psychological and physiological processes through which knowledge, attitudes and behaviors are shaped; and the creation of messages related to health and social well-being, as well as how strategic messages campaigns are can influence decision making and social development.* Communication, Organizations, & Culture focuses on the role of communication in creating, maintaining and transforming socially collective groups ranging from for-profit businesses and corporations to non-profit community organizations and social movements. Because culture is central to social change and stasis, the study of intercultural communication is an integral scholarly component. Students focus on how meanings surrounding race, gender, ethnicity, and nationality are created and challenged through communicative practices.Thesis and non-thesis options are available in the M. A. program. In general, those interested in pursuing doctoral work choose the thesis option while those planning other career options choose the non-thesis option.

Post-Graduate Employment Opportunities

Graduates of The Edward R. Murrow College of Communication graduate program are prepared for careers in teaching, research, and public service. Potential employers of program graduates include colleges and universities, private industry, and governmental agencies.

Contact Information

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Faculty

Erica Austin, Frederick Busselle, Prabu David, David Demers, Jolanta Drzewiecka, Douglas Hindman, Elizabeth Hindman, Stacey Hust, E James, Todd Norton, Jeffery Peterson, Bruce Pinkleton, Lawrence Pintak, Michael Salvador, Patricia Sias, Alexis Tan and Changmin Yan.

COM

500 Introduction to Graduate Study 1 Prereq Graduate Standing, Permission of Instructor. Introduces graduate students to the pragmatics of graduate education and to research being conducted in the School of Communication.

501 Theory Building in Communication 3 Prereq graduate standing. Relationship of research to theory development; evaluation of current theory and research; planning and executing research within specified theoretical frameworks.

504 Instructional Practicum 1 May be repeated for credit; cumulative maximum 4 hours. Prereq graduate standing; by interview only.

506 Persuasion and Social Influence 3 Prereq graduate standing. Theories, concepts strategies and processes of persuasion and social influence.

507 Communication Ethics Seminar 3 Prereq graduate standing. Topics in communication ethics.

509 Quantitative Research 3 Prereq graduate standing. Introduction to quantitative research in communication; hypothesis development, testing; basic statistics, interpretation; field surveys, laboratory and field experiments, content analysis.

514 Health Communication Theories and Campaigns 3 Health communication theories with a focus on campaign construction and evaluation.

516 Health Communication and Society 3 3 Reviews, critiques and applications of research regarding the impact of social and cultural environments on health communication.

517 Health Communication and Social Development 3 Prereq graduate standing. Explores and tests role of mediated communication in the causes of and colutions for health problems, particularly among young people.

521 Foundational Perspectives in Intercultural Communication 3 Prereq graduate standing. Overview of three current foundational research perspectives in intercultural communication; functionalist (post-positivist), interpretive and critical.

522 Theoretical Perspectives on Intercultural Communication 3 Prereq graduate standing. Advanced readings in intercultural communication theory and methods; paradigms in current theorizing.

524 Intercultural/International Communication and Social Change 3 Prereq graduate standing. Application of communication theory, research and technologies aimed at fostering social change in intercultural and international contexts.

526 Current Topics in Intercultural Communication 3 Prereq graduate standing. Topics in current intercultural communication research.

535 Organizational Communication Theory 3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing. Traditional and emerging theories in organizational communication.

537 Organization and Society 3 Prereq graduate standing. Historical foundations, theoretical developments, contemporary issues and practical implications of communicative processes of organizations within society.

550 Media Processes and Effects: Theory and Practice 3 Physiological, psychological and social effects of media messages and technologies upon individuals and societies.

552 Current Issues in Media Processes and Effects 3 Prereq graduate standing. Current issues in media processes and effects.

570 Communication Theory 3 Prereq graduate standing. Relevant theories and research from mass and interpersonal communication.

571 Theoretical Perspectives on Media and Society 3 Prereq graduate standing. Theories explaining the social and cultural environments of communication processes emphasizing in mass communication.

572 Mass Media, Social Control, and Social Change 3 Prereq graduate standing. Study of the forces that influence the media's role as an agent of social control or social change.

573 Media and Public Discourse 3 Prereq graduate standing. Historical and contemporary concepts, questions and dynamics constituting the role of media and discourse among various publics.

580 Topics in Communication 3 May be repeated for credit; cumulative maximum 12 hours. Prereq graduate standing; by interview only. Contemporary, specialized, or technical topics in communication.

591 Qualitative Research Methods 3 Prereq graduate standing. Historical, textual, and legal methodologies for theory-based evaluative and discourse studies in communication.

599 Seminar in Communication 3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing; by interview only. Special topics in rhetoric, communication, and public address.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit. Prereq by interview only.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit. Prereq by interview only.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit. Prereq by interview only.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit. Prereq by interview only.

Computer Engineering

Degree offered: Master of Science in Computer Engineering

Faculty working with graduate students: 1

Graduate students: 9

Graduate students receiving assistantships or scholarships: 11%

Tests required: GRE (Combined), TOEFL

Deadline: Fall: January 10th
Spring: July 1st

Requirements

Please see the program/department for more information.

Contact Information

Sidra Gleason
Academic Coordinator
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Pullman, WA 99164-2752
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E-mail: sidra@eecs.wsu.edu

Faculty

Robert Olsen.

Electrical Engineering

E E

501 Linear System Theory 3 Prereq E E 489. Dynamic systems from the state variable approach; observability, controllability, stability, and sensitivity of differential and non-differential systems.

502 Linear Multivariable Control 3 Prereq E E 501. Optimal linear feedback control, optimal stochastic observers, LQG/LTR design methodology, modern Wiener-Hopf design, robust controllers.

503 Structure, Dynamics and Control of Large-scale Networks 3 Prereq E E 501, 507. Introduction and development of computational and analytical methods required to characterize large-scale networks.

504 Modern Optics 3 Prereq E E 341, 351, Stat 443. Diffraction theory, Fourier transforming and imaging properties of lenses, spatial filtering, holography, temporal and spatial coherence, imaging through random media.

505 Nonlinear System Theory 3 Prereq E E 501. Overview of nonlinear phenomena, Lyapunov stability, input-output stability, periodic orbits, singular perturbation, differential geometric methods, bifurcations and complex behaviors.

507 Random Processes in Engineering 3 Prereq Stat 443. Functions of random variables; random sequences; stochastic processes; mean-square stochastic calculus; ergodicity; spectral density; linear transformations, filtering, dynamic systems.

508 Estimation Theory for Signal Processing, Communications, and Control 3 Prereq E E 501, 507, or equivalent. Principles of statistical estimation; LLSE; Kalman filtering; smoothing; prediction; maximum- likelihood and Bayesian estimation.

509 Adaptive Control 3 Prereq E E 501. Model reference adaptive systems (MRAS), adaptive observers, adaptive control, on-line identification, robustness issues, self-tuning regulators.

511 Protection of Power Systems II 3 Prereq E E 491 or c//. Protection of electrical equipment as related to electric power systems with emphasis on digital algorithms.

518 Advanced Electromagnetic Theory I 3 Prereq E E 351. Electromagnetic waves, electromagnetic theorems and concepts, solutions to the wave equation in rectangular, cylindrical and spherical coordinates.

520 Plasma Engineering 3 Prereq E E 351 or Phys 342. Electromagnetics, kinetic theory, and fluid mechanics of plasmas in space, arcs, plasma processing, coronas, and fusion reactors.

521 Analysis of Power Systems 3 Prereq E E 491. Concepts and practices of modern power engineering, including steady-state and dynamic analysis, economics and control design.

524 Advanced Computer Architecture 3 Prereq E E 334. Instruction set architectures, pipelining and super pipelining, instruction level parallelism, superscalar and VLIW processors, cache memory, thread-level parallelism and VLSI.

527 Antenna Theory and Design 3 Prereq E E 351. Antenna fundamentals, analytical techniques, characteristics and design procedures for selected types of wire, broadband, and aperture antennas.

528 Advanced Topics in Electromagnetics 3 May be repeated for credit; cumulative maximum 6 hours. Prereq E E 351. Advanced topics of current interest in wave propagation (electromagnetics, acoustics, or optics).

530 Digital Signal Processing II 3 Prereq E E 464, 507, or permission. Frequency selective digital filtering, least-squares filtering, adaptive filtering, multirate signal processing.

535 Numerical Solutions to EM Problems I 3 Prereq E E 351. Theory and use of finite-difference time-domain; numeric dispersion; absorbing boundary conditions; scattering; radiation; time-domain vs. frequency-domain.

545 Data Compression 3 Prereq E E 507. Source coding with a fidelity criterion; quantization theory; predictive, transform and subband coding; noiseless source codes.

548 Information Theory and Channel Coding 3 Prereq E E 451, 507. Information theory; entropy, mutual information, source and channel coding theorems, channel capacity, Gaussian channels; channel coding: block and convolutional codes.

551 Data Communication Systems 3 Prereq E E 341, 507. Digital communications; multi-amplitude/phase signal constellations; probability of error performance; cutoff rate; Viterbi algorithm; trellis coded modulation.

555 Computer Communication Networks 3 Prereq Stat 443. Packet switching networks; multi-access and local-area networks; delay models in data networks; routing and flow control.

562 Fault Tolerant Computer Systems 3 Prereq Cpt S 460; Cpt S 464 or 564. Same as Cpt S 562.

571 Advanced Wireless Integrated Circuits and Systems 3 Prereq E E 341 and 351 or 431. Analysis and design methodologies of state-of-the-art wireless integrated circuits and systems.

576 Analog Integrated Circuits 3 Prereq graduate standing; E E 311; E E 351 or c//; E E 489 or c//. Graduate-level counterpart of E E 476; additional requirements. Credit not granted for both E E 476 and 576.

581 Advanced Topics in Power Systems V 2-3 May be repeated for credit; cumulative maximum 6 hours. Prereq E E 521. Power system operations including AGC, economic dispatch and security; power system dynamics; intelligent systems applications.

582 Advanced Topics V 1-3 May be repeated for credit.

586 VLSI Systems Design 3 Prereq E E 311. VLSI models, layout algorithms, design methodologies, simulation and layout tools, algorithm design for VLSI implementation.

587 System on Chip (SoC) Design and Test 3 Prereq E E 434, 466. System on Chip (SoC) and sub-micron integrated circuit design and testing.

595 Directed Study in Electrical Engineering V 1 (0-3) to 3 (0-9) May be repeated for credit. Current topics in electrical engineering.

596 Advanced Analog Integrated Circuits 3 Prereq E E 476, 477. MOS and BiCMOS technologies; MOS and BiCMOS operational amplifiers; A/D, D/A converters; switched-capacitor filters; continuous-time filters.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Computer Engineering

Degree offered: Master of Science in Computer Engineering - Non Thesis

Faculty working with graduate students: 12

Graduate students: 5

Tests required: GRE (Combined), TOEFL

Deadline: Fall: January 10th
Spring: July 1st

Requirements

Please see the program/department for more information.

Contact Information

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Pullman, WA 99164-2752
Telephone: 509-335-6636
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Faculty

David Bakken, Benjamin Belzer, Anjan Bose, Shira Broschat, Diane Cook, Zhe Dang, Jose Delgado-Frias, Thomas Fischer, Carl Hauser, Deuk Heo, Lawrence Holder and Christopher Hundhausen.

Electrical Engineering

E E

501 Linear System Theory 3 Prereq E E 489. Dynamic systems from the state variable approach; observability, controllability, stability, and sensitivity of differential and non-differential systems.

502 Linear Multivariable Control 3 Prereq E E 501. Optimal linear feedback control, optimal stochastic observers, LQG/LTR design methodology, modern Wiener-Hopf design, robust controllers.

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562 Fault Tolerant Computer Systems 3 Prereq Cpt S 460; Cpt S 464 or 564. Same as Cpt S 562.

571 Advanced Wireless Integrated Circuits and Systems 3 Prereq E E 341 and 351 or 431. Analysis and design methodologies of state-of-the-art wireless integrated circuits and systems.

576 Analog Integrated Circuits 3 Prereq graduate standing; E E 311; E E 351 or c//; E E 489 or c//. Graduate-level counterpart of E E 476; additional requirements. Credit not granted for both E E 476 and 576.

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582 Advanced Topics V 1-3 May be repeated for credit.

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600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Computer Science

Degree offered: Doctor of Philosophy (Computer Science)

Requirements

Please see the program/department for more information.

Computer Science

Degree offered: Master of Science in Computer Science

Program offered: Pullman, Tri-Cities

Requirements

Please see the program/department for more information.

Computer Science

Degree offered: Master of Science in Computer Science - Non Thesis

Program offered: Pullman, Tri-Cities

Requirements

Please see the program/department for more information.

Computer Science - Vancouver

Degree offered: Master of Science in Computer Science

Faculty working with graduate students: 7

Graduate students: 12

Graduate students receiving assistantships or scholarships: 41%

Program offered: Vancouver

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

Students also must complete nine credit hours of CS 700 Masters Research and Examination. Two CS 700 credits must be taken in the semester during which the student intends to defend the thesis.

Program Description

The Master of Science in Computer Science program in the School of ENCS is a thesis program and requires 30 credit hours, including 21 hours of graded course work and 9 credits of thesis research (CS 700). The coursework and research are in the general areas of software engineering, artificial intelligence, computer networks and computer graphics. Sophisticated facilities are available for instruction and research. Teaching and research assistantships are available for qualified students. Before undertaking graduate study in computer science, the student should have completed a baccalaureate degree substantially similar to the BSCS degree described below in the BSCS schedule of studies. Students from other academic disciplines are encouraged to apply, however such students will be required to take or have taken the equivalent of the following courses: CS 317, CS 360 and CS 450, including all prerequisites for these courses. An undergraduate grade point average of 3.0 is a minimum for admission to the MS program.

Degree Description

The Master of Science in Computer Science program in the School of ENCS is a thesis program and requires 30 credit hours, including 21 hours of graded course work and 9 credits of thesis research (CS 700). The coursework and research are in the general areas of software engineering, artificial intelligence, computer networks and computer graphics. Sophisticated facilities are available for instruction and research. Teaching and research assistantships are available for qualified students. Before

undertaking graduate study in computer science, the student should have completed a baccalaureate degree substantially similar to the BSCS degree described below in the BSCS schedule of studies. Students from other academic disciplines are encouraged to apply, however such students will be required to take or have taken the equivalent of the following courses: CS 317, CS 360 and CS 450, including all prerequisites for these courses. An undergraduate grade point average of 3.0 is a minimum for admission to the MS program.The WSU Vancouver MS in Computer Science is designed and administered separately from the MS program in Pullman. If you designate the WSU Pullman program as your main objective, you will not be automatically considered by the Vancouver program unless you submit the specific documentation requested on our "How to Apply" web page (http://encs.vancouver.wsu.edu/how-apply). Except in rare cases, only those who indicate WSU Vancouver as their main objective will be prompted to submit any missing documentation so our Selection Committee can review their completed applications.

Contact Information

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Faculty

David Chiu, Wayne Cochran, Thanh Dang, Charles Lang, Sarah Mocas, Orest Pilskalns and Scott Wallace.

Computer Science - Vancouver

CS

425 **Digital Forensics** 3 Prereq CS 360 with a C or better. Use of computers in the investigation of criminal and civil incidents in which computers or computer technology play a significant or interesting role.

427 **Computer Security** 3 Prereq CS 216 with a C or better; CS 360 with a C or better. Computer security concepts, models and mechanism; encryption technology, formal models, policy and ethical implications. Credit not granted for both CS 427 and 527.

440 **Artificial Intelligence** 3 Prereq CS 320 with a C or better; Stat 360 with a C or better or Math 212 with a C or better. Knowledge representation and automated problem solving; theory and application of agent programming.

442 **Computer Graphics** 3 Prereq CS 223 with a C or better; CS 320 with a C or better; Math 220 with a C or better. Raster operations; transformations and viewing; geometric modeling; visibility and shading; color. Credit not granted for both CS 442 and 542.

443 **Human-Computer Interaction** 3 Prereq junior standing. Introduction to the field of human-computer interaction; understanding the system user; user-centered design and evaluation techniques including heuristic evaluation and usability testing.

447 **Computer Game Design** 3 Prereq CS 223 with a C or better; CS 320 with a C or better. Design and implementation of computer games. Credit not granted for both CS 447 and 547.

452 **Compiler Design** 3 Prereq CS 317 with a C or better; CS 355 with a C or better. Design of lexical analyzers, syntactic analyzers, intermediate code generators, code optimizers and object code generators.

453 **Web Data Management** 3 Prereq CS 351 with a C or better. Introduction of concepts, data models, query and retrieval languages; implementation issues for management of web data.

466 **Embedded Systems** 3 (2-3) Prereq CS 360 with a C or better or ECE 234 with a C or better. Design and development of real-time and dedicated software systems with an introduction to sensors and actuators. Credit not granted for both CS 466 and 566.

516 **Theory of Computation** 3 Discrete structures, automata, formal languages, recursive functions, algorithms, computability, and complexity.

521 **Software Engineering Analysis** 3 Research in software engineering; application of quantitative techniques in the software life cycle; current software engineering literature; exploration of techniques of mathematical modeling and solutions to software engineering problems.

527 **Computer Security** 3 Graduate-level counterpart of CS 427; additional requirements. Credit not granted for both CS 427 and 527.

541 **Artificial Intelligence** 3 Background preparation must include prior knowledge and experience in artificial intelligence. Intelligent computer programs; simulation of cognitive processes.

542 **Computer Graphics** 3 Graduate-level counterpart of CS 442; additional requirements. Credit not granted for both CS 442 and 542.

547 **Computer Game Design** 3 Graduate-level counterpart of CS 447; additional requirements. Credit not granted for both CS 447 and 547.

548 **Advanced Computer Graphics** 3 Solid modeling, visual realism, light and color models, advanced surface generation techniques.

558 **Wireless Sensor Networks** 3 Design and implementation of sensor networks.

566 **Embedded Systems** 3 (2-3) Prereq graduate standing. Graduate-level counterpart of CS 466; additional requirements. Credit not granted for both CS 466 and 566.

570 **Machine Learning** 3 Introduction to building computer systems that learn from their experience; classification and regression problems; unsupervised and reinforcement learning.

580 **Advanced Topics in Computer Science** 3 May be repeated for credit.

595 **Directed Study in Computer Science** V 1 (0-3) to 3 (0-9) May be repeated for credit; cumulative maximum 3 hours. Current topics in computer science.

700 **Master's Research, Thesis, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

Constraints Management - Cert in Constraints Management

Degree offered: Graduate Certificate in Constraints Management

Graduate students: 15

Program offered: DDP

Deadline: Fall: July 15 (January 10 international)
Spring: November 15 (July 1 international)
Summer: April 1 (Default international)

Requirements

Students must apply for the certificate and pay the required fee, the first half of the final semester.

Program Description

The ETM Certificate Program allows students to complete shorter professional blocks of coursework relevant to their specific needs. Rather than completing all the course requirements for an ETM master's degree, students may take four courses (12-credit hours) in specialized areas. A certificate is awarded upon completion of these courses. Course credits earned for a certificate may also apply to a master's

degree in the ETM Program or other graduate degree programs. A student may earn more than one certificate and may work on the certificate and master's program concurrently.

Degree Description

The Theory of Constraints (TOC) focuses all management attention on the few limiting factors of any system. By providing specific methods of managing variability, TOC creates exceptional performance very quickly and then encourages a process on on-going improvement through the focused use of LEAN and Six Sigma tools. The TOC methods apply to every level of the organization and a every level of maturity. As a result, using TOC over time results in a stable and ever improving organization. This certificate teaches the TOC proven solutions and the TOC thinking process for new solutions. It includes managing people, processes, projects, finances and strategy for a company.

Training and Professional Development Opportunities

The Constraints Management Certificate prepares student for the TOC Certification Exams in Supply Chain Logistics, Project Management, TOC Thinking Process and Business Strategy exam given by the Theory of Constraints International Certification Organization.Students with the Constraints Management Certificate are effective 'change agents' who can lead rapid improvement efforts and stabilize organizations. This talent applies with internal and external consulting as well as management positions. They can implement the TOC solutions which are highly effective.There is a growing demand for Critical Chain Project Managers as well as TOC experts in Production and Distribution. Students with this certificate became Technical Fellows at Boeing, Senior Managers at many companies, CEO of technical companies, Program Leads, Research Directors and independent consultants. Students taking this certificate in the past included medical doctors, judges, cost analyst, rocket scientist, cabinet makers, Professors and consultants

Contact Information

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Patti Elshafei
Program Support Supervisor
Engineering and Technology Management
Telephone: 509-335-0125
E-mail: engrmgt@wsu.edu

Engineering Management

E M

501 Management of Organizations 3 Exploration of issues related to individual behavior in work organizations, including motivation, leadership, team-building, and team management skills.

520 Construction Project Management 3 Prereq graduate standing. Construction project bids, proposals, contracts, project delivery/organization; estimating, scheduling, resource loading, project monitoring and controls, safety and quality

526 Constraints Management 3 Graduate-level counterpart of E M 426; additional requirements. Credit not granted for both E M 426 and 526.

530 Applications of Constraints Management 3 Graduate-level counterpart of E M 430; additional requirements. Credit not granted for both E M 430 and 530.

534 Contemporary Topics in Constraints Management 3 May be repeated for credit; cumulative maximum 6 hours. Prereq E M 526 or 530. Contemporary teaching tools, software packages, current techniques and thought in managing complex systems using the theory of constraints.

555 Enterprise Resource Management 3 Prereq graduate standing. Focusing the flow of quality, timely products and cooperative supply chain operations and planning using simulation and effective enterprise resource management.

565 Introduction to Systems Management 3 Prereq graduate standing. Design manufacture, operation of complex system development for engineering managers; project planning, organizing, and controlling tools for engineering system constraints.

Construction Project Management - Cert in Construction Project Mgt

Degree offered: Graduate Certificate in Construction Project Management

Graduate students: 5

Program offered: DDP

Deadline: Fall: July 15 (January 10 international)
Spring: November 15 (July 1 international)
Summer: April 1 (Default international)

Requirements

Student must apply for graduation with the certificate the final semester according to graduate school deadlines.

Program Description

The ETM Certificate Program allows students to complete shorter professional blocks of coursework relevant to their specific needs. Rather than completing all the course requirements for an ETM master's degree, students may take four courses (12-credit hours) in specialized areas. A certificate is awarded upon completion of these courses. Course credits earned for a certificate may also apply to a master's degree in the ETM Program or other graduate degree programs. A student may earn more than one certificate and may work on the certificate and master's program concurrently. Eight certificates are available in the Master of Engineering and Technology Management degree program.

Degree Description

It is necessary for construction project managers to update their skills in modern project management techniques, to effectively contribute to the continuing growth of the industry. The increasing complexity of construction projects requires the manager to know and understand many different facets in order to become/remain proficient in the field. The CPM certificate provides the recipients with the skills to manage any type of project (not only construction) involving contractors and subcontractors Many professionals have reported that this certificate has allowed them to advance in their careers as a project manager and as a technology manager.

Contact Information

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Program Support Supervisor
ENGINEERING AND TECHNOLOGY MANAGEMENT
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WSU
Pullman, WA 99164-2785
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Fax: 509-335-7290
E-mail: pelshafei@wsu.edu

Engineering Management

E M

508 Legal Concepts for Engineering and Technical Managers 3 Prereq graduate standing. Basic legal obligations of engineering/technical managers; identify, minimize and recognize risks and liability; contemporary legal environment and business law.

520 Construction Project Management 3 Prereq graduate standing. Construction project bids, proposals, contracts, project delivery/organization; estimating, scheduling, resource loading, project monitoring and controls, safety and quality

522 Supervision and Leadership for Engineering and Technology Managers 3 Prereq graduate standing. Strategies of supervision with practical application techniques presented to create individual and organizational motivation.

564 Project Management 3 Planning, organizing, scheduling and controlling major projects; human dimensions, PERT and CPM scheduling models, resource allocation, and cost controls. Credit not granted for both E M 464 and 564.

Counseling Psychology - Counseling

Degree offered: Master of Arts in Education

Faculty working with graduate students: 11

Graduate students: 37

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal)

Deadline: Fall: January 10

Requirements

The School Counseling and Community Counseling programs are available at the Pullman campus. Most students are enrolled full-time. The curriculum for both programs includes course work in theory, research, and techniques in individual and group counseling; vocational/career counseling and assessment; professional and ethical issues; life-span development; counseling diverse populations; statistics, measurement, and research design. In addition, students in the School Counseling program complete a two-course sequence on current issues in school counseling, a course in cognitive assessment, a course in learning theory, and two semesters of internship in the public school setting. Students in the Community Counseling program take additional coursework in personality assessment, diagnosis and psychopathology, and two semesters of internship in community mental health settings. For both programs, additional courses are available on an elective basis, including courses on hypnosis, counselor supervision, substance abuse counseling, Chicano/Latino psychology, cross-cultural counseling research, social psychology, and program evaluation.

Program Description

The counseling psychology program offers a Ph.D. degree, available in Pullman; and a master of arts degree available at the Pullman and Tri-Cities campuses. For general information about all counseling psychology and counseling graduate programs, email gradstudies@wsu.edu or call (509) 335-7016 or (509) 335-9195. Ph.D. program in counseling psychology This program prepares students for careers in counseling, teaching, research, and other professional roles as counseling psychologists. For example, graduates obtain positions in university counseling centers, academic faculty in counseling psychology departments, private or group practice in psychology, or other mental health settings as therapists. Graduates of the program are license-eligible in most states. The Ph.D. program has been accredited by the American Psychological Association (APA) since 1990. Masters programs with emphases in school and community counseling Masters degrees in counseling focus on one of two professional options: (1) school counseling, which prepares students for residency certification as K-12 school counselors, and (2) community counseling, which, in combination with the fulfillment of additional post-degree requirements, prepares students for licensure as a mental health counselor. Students in either program can pursue the master of arts (M.A.) degree, with or without thesis. TThe M.A. degree, with thesis, can be helpful for students who plan to subsequently apply for doctoral programs or who have a strong interest in conducting research, although M.A. graduates without thesis also apply for and enter doctoral programs.

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Post-Graduate Employment Opportunities

School counselors, counselors in community mental health centers, other helping professions.

Post-Graduate Career Placements

Master's program: Counselor, Inchelium School (Colville Reservation); Ph.D. student in counseling psychology programs; family wellness manager, Native American Rehabilitation Association of the Northwest.

Contact Information

Graduate Coordinator
Washington State University
Office of Graduate Studies
Cleveland Hall 252
PO Box 642114
Pullman, WA 99164-2114
Telephone: 509-335-9195
Fax: 509-335-2097
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Faculty

Olusola Adesope, Arreed Barabasz, Marianne Barabasz, Stephanie Bauman, Austin Church, Phyllis Erdman, Brian French, Susan Jensen, Laurie McCubbin, Brian McNeill and Michael Trevisan.

COPSY

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537 Professional Development in Counseling Psychology 3 NBCC requirements; growth and development, social and cultural foundations, the helping relationship, group dynamics, career, appraisal and research.

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542 Cross-cultural Research in Counseling and Assessment 3 Cross-cultural research methods, concepts, and findings in counseling and assessment.

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EDPSY

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Counseling Psychology - Counseling

Degree offered: Master of Arts in Education - Non Thesis

Faculty working with graduate students: 11

Graduate students: 27

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal)

Deadline: Fall: January 10

Requirements

The School Counseling and Community

Counseling programs are available at the Pullman campus. Most students are enrolled full-time. The curriculum for both programs includes course work in theory, research, and techniques in individual and group counseling; vocational/career counseling and assessment; professional and ethical issues; life-span development; counseling diverse populations; statistics, measurement, and research design. In addition, students in the School Counseling program complete a two-course sequence on current issues in school counseling, a course in cognitive assessment, a course in learning theory, and two semesters of internship in the public school setting. Students in the Community Counseling program take additional coursework in personality assessment, diagnosis and psychopathology, and two semesters of internship in community mental health settings. For both programs, additional courses are available on an elective basis, including courses on hypnosis, counselor supervision, substance abuse counseling, Chicano/Latino psychology, cross-cultural counseling research, social psychology, and program evaluation. 4000 Character Limit.

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Post-Graduate Employment Opportunities

School counselors, counselors in community mental health centers, other helping professions.

Post-Graduate Career Placements

Master's program: Counselor, Inchelium School (Colville Reservation); Ph.D. student in counseling psychology programs; family wellness manager, Native American Rehabilitation Association of the Northwest.

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Counseling Psychology

Degree offered: Doctor of Philosophy (Education)

Faculty working with graduate students: 11

Graduate students: 42

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal)

Deadline: Fall: January 10

Requirements

Students in the doctoral program who have completed a master's degree may be allowed to waive certain required courses. Once admitted, a complete waiver application must be submitted to the Office of Graduate Studies for each course a student wishes to waive by May 1st.

Program Description

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Degree Description

The Ph.D. program in counseling psychology is accredited by the American Psychological Association. The program was awarded the Suinn Minority Achievement award, which is awarded by the APA to programs that are exemplary in the recruitment and retention of diverse students and in a program focus on cultural diversity

Post-Graduate Employment Opportunities

Postdoctoral clinical or research positions, staff psychologist at university counseling centers, university faculty, licensed psychologist in private practice, and in community mental health organizations.

Post-Graduate Career Placements

Psychologist, San Jose State University; assistant professor, De La Salle University (Philippines); mental health specialist, LeRoy Haynes Center for Children (Laverne, CA); behavioral therapist, St. Luke's Rehabilitation Institute (Spokane, WA); postdoctoral position at University of California, Berkeley

Contact Information

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ED AD

536 Introduction to Qualitative Research in Education 3 Prereq EdPsy 505. Introduction to the theory and methods of qualitative research; field relations, data collections, data analysis, hypothesis development, and theory generation.

537 Advanced Qualitative Research in Education 3 Prereq EdRes 564. Advanced theory and methods of qualitative research; theoretical foundations, data collection and analysis, and reporting.

EDPSY

502 Theoretical Foundations of Learning and Instruction 3 Historical and contemporary theories of learning and instruction: application of theory in counseling and teaching settings.

505 Research Methods I 3 Research methods; literature review; design, implementation, and interpretation of results.

509 Educational Measurements: Test Development and Assessment V 2-3 Theory and use of standardized educational measurement instruments; intelligence, aptitude, and achievement tests; measurement of outcomes.

563 Principles of Research 3 Prereq EdRes 562 or CoPsy 501. Same as EdRes 563.

565 Quantitative Research 3 Prereq EdPsy 508; EdRes 563. Same as EdRes 565.

568 Research Methods II 3 Prereq EdPsy 505, 565. Integration and application of research skills in writing proposals, dissertations, papers for publication; interpreting, critiquing, and synthesizing research studies.

569 Seminar in Quantitative Techniques in Education 2 or 3 May be repeated for credit; cumulative maximum 6 hours. Prereq EdPsy 565. Application of parametric and nonparametric statistics, data processing using computer packages in educational research.

570 Introduction to Program Evaluation 3 Prereq EdPsy 505. Introduction to strategies and techniques for evaluation of educational and social programs.

EDRES

566 Research Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Prereq doctoral student. Presentation and analysis of research; professional development in research presentation.

PSYCH

534 Clinical Psychopharmacology 3 Prereq Psych 533. Classification, clinical application, and mechanisms of psychotherapeutic drugs used in the treatment of mental disorders.

538 Child Therapy Practicum 3 May be repeated for credit; cumulative maximum 18 hours. Prereq by interview only. Supervised practice in the clinical application of psychology with children and families.

547 Medical Psychology Practicum 3 May be repeated for credit; cumulative maximum 18 hours. Prereq by interview only. Supervised practice in the clinical application of psychology at the WSU Health and Wellness Service.

574 Physiological Psychology 3 Neuroanatomical, neurochemical, and other biological cases of human and animal behavior.

Counseling Psychology

Degree offered: Master of Education

Faculty working with graduate students: 11

Program offered: Pullman, Tri-Cities, Vancouver

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal)

Deadline: Fall: January 10

Requirements

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Training and Professional Development Opportunities

None

Post-Graduate Employment Opportunities

None

Post-Graduate Career Placements

None

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E-mail: gradstudies@wsu.edu

Faculty

Olusola Adesope, Arreed Barabasz, Marianne Barabasz, Stephanie Bauman, Austin Church, Phyllis Erdman, Brian French, Susan Jensen, Laurie McCubbin, Brian McNeill and Michael Trevisan.

COPSY

501 Historical and Philosophical Foundations of Counseling Psychology 3 Prereq admission to Counseling Psychology PhD program. History of counseling psychology; philosophical and psychological systems; current identity of counseling psychology as an academic discipline and a profession.

511 Theories, Research, and Techniques in Counseling Psychology I 3 Philosophical assumptions, theory of personality, counseling process, techniques and relevant research in the major theories of counseling and personality.

512 Theories, Research, and Techniques in Counseling Psychology II 3 Prereq CoPsy 511. Advanced study of process techniques and outcome research in the field of counseling and psychotherapy; nonspecific process skills are presented and integrated into specific, empirically validated interviews.

513 Career Counseling: Theories and Methods 3 Theories, concepts, methods and findings in career counseling; vocational assessment and prediction.

515 Ethics and Professional Problems in Counseling Psychology 3 Professional problems; ethical, legal, and training issues, practices, and new issues.

516 Life Span Development and Counseling Issues 3 Prereq graduate standing. Major theories and issues in human development and their application to counseling practice including case conceptualization, treatment and intervention planning and psychological assessment and research.

517 Diagnoses, Psychopathology and Counseling Psychology 3 Prereq CoPsy 511 and 512; graduate standing. Psychopathology and the application of counseling theories to diagnoses, case conceptualization, assessments, treatment plans and research.

518 Theoretical Foundations of Group Counseling 3 Prereq CoPsy 512 or c//. History, philosophy and theoretical foundations; the group counselor, members, and issues in group counseling.

523 Topics in Counseling Psychology V 1-4 May be repeated for credit; cumulative maximum 8 hours. Recent research, developments, issues, and/or applications in selected areas of counseling psychology.

525 Counseling Diverse Populations 3 Prereq CoPsy 512. Research and theories regarding the influence of culture, gender, and lifestyle on counseling processes; application of appropriate assessment/treatment strategies.

527 Individual Appraisal I 3 Prereq EdPsy 508, 509. Cognitive assessment of individuals, with an emphasis on the theoretical background and practical skills needed to administer, score, and interpret individual intelligence tests; assessment of learning disabilities, AD/HD, and individual achievement.

528 Individual Appraisal II 3 Prereq CoPsy 527. Interpretation of representative personality assessment inventories and symptom checklists used in counseling practice; integration of results in psychological reports.

529 Counselor Supervision: Theory, Research, and Practice 3 Prereq admission to Counseling Psychology PhD program. Survey of major theoretical approaches, techniques, and research in models of counselor supervision and training.

531 Current Issues in School Counseling I 3 Prereq CoPsy 512, 518. Issues of immediate concern to school counselors: drug abuse, family violence, adolescent suicide, sexual orientation, crisis intervention, consultation and referral.

532 Current Issues in School Counseling II 3 Prereq CoPsy 531. Additional coverage of contemporary issues of concern to school counselors; comprehensive developmental school programs, school community dynamics, parental involvement, consultation.

533 Master's Internship in Community Counseling 4 (3-3) May be repeated for credit; cumulative maximum 16 hours. Prereq CoPsy 512, 513, 515; 527 or c//; or by interview only. Supervised experience in the application of counseling theory and techniques in an agency setting. May be reapeated for credit; cumulative maximum 8 hours.

535 Master's Internship in School Counseling 4 (3-3) May be repeated for credit; cumulative maximum 16 hours. Prereq CoPsy 512, 513, 518; 515 or c//; 527 or c//; or by interview only. Supervised experience in the application of guidance and counseling theory and techniques in a school setting.

537 Professional Development in Counseling Psychology 3 NBCC requirements; growth and development, social and cultural foundations, the helping relationship, group dynamics, career, appraisal and research.

541 Clinical and Experimental Hypnosis Seminar 3 Prereq PhD student in counseling, educational, experimental, or clinical psychology. Clinical and experimental hypnosis, emphasizing applied research and clinical methods.

542 Cross-cultural Research in Counseling and Assessment 3 Cross-cultural research methods, concepts, and findings in counseling and assessment.

551 Doctoral Practicum in Counseling Psychology I 4 (2-6) Prereq CoPsy 512, 513, 515, by interview only. Supervised experiences in the application of counseling psychology theory and techniques.

552 Doctoral Practicum in Counseling Psychology II 4 (2-6) Prereq CoPsy 551, by interview only. Supervised experiences in the application of counseling psychology theory and techniques.

553 Doctoral Practicum in Counseling Psychology III 4 (3-3) May be repeated for credit; cumulative maximum 16 hours. Prereq CoPsy 552, by interview only. Supervised experiences in the application of counseling psychology theory and techniques.

561 Continuing Counseling ESA Certification V 2-6 May be repeated for credit; cumulative maximum 6 hours. Prereq Initial Counselor Certification; equivalent of 180 full days of school counselor experience. Peer review requirements for continuing level ESA Counselor Certification.

590 Seminar in Research in Counseling Psychology 3 By interview only. Recent developments in counseling psychology research and design applied to PhD dissertation proposals.

597 Counseling Psychology Internship V 2 (0-6) to 4 (0-12) May be repeated for credit; cumulative maximum 8 hours. Supervised internship experience, individual and group counseling, evaluation, assessment, supervision, and teaching.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

EDPSY

502 Theoretical Foundations of Learning and Instruction 3 Historical and contemporary theories of learning and instruction: application of theory in counseling and teaching settings.

505 Research Methods I 3 Research methods; literature review; design, implementation, and interpretation of results.

508 Educational Statistics 3 Prereq EdPsy 505. Introductory course for graduate students in applied statistics for the behavioral sciences.

509 Educational Measurements: Test Development and Assessment V 2-3 Theory and use of standardized educational measurement instruments; intelligence, aptitude, and achievement tests; measurement of outcomes.

Criminal Justice

Degree offered: Doctor of Philosophy (Criminal Justice)

Faculty working with graduate students: 9

Graduate students: 20

Graduate students receiving assistantships or scholarships: 45%

Program offered: Pullman, Spokane

Tests required: GRE (Combined)

Deadline: Fall: January 10
Spring: July 1

Requirements

None other than listed

Program Description

The Criminal Justice graduate program is designed to increase student understanding of the nature and causes of crime, the operation of the criminal justice system and its institutions, and the development and reform of criminal justice policy. Courses and research are grounded in theoretical foundations upon which students can learn to address real world problems. Emphasis is placed on understanding, designing, and conducting research from multiple perspectives to help students become educated policymakers, researchers, and scholars. Substantive emphases include criminal justice institutions and policies, the connections between criminal justice policies and public health, and comparative and international criminal justice. Courses are taught and research is conducted from an interdisciplinary perspective by a diversely educated graduate faculty.

Degree Description

The Criminal Justice Ph.D. program is to advance the development of criminological and criminal justice research and theory, and to train graduate students to conduct and understand theoretically based research involving crime and the criminal justice system. Upon completion of their graduate program, graduate students in criminal justice will be able to read and evaluate data and social science research, analyze and develop criminal justice policy, conduct independent research related to criminology and criminal justice, and communicate original research findings and analyses of secondary research cogently for consideration by multiple audiences. 1000 Character Limit.

Training and Professional Development Opportunities

Program evaluation, online instruction and curriculum development, advanced statstical training

Post-Graduate Employment Opportunities

Academia, grant specialist, research manager, and planning and evaluation director for state and local criminal justice agencies.

Post-Graduate Career Placements

Research university professorships, police and corrections management.

Contact Information

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Faculty

David Brody, Laurie Drapela, Zachary Hamilton, Zachary Hays, Nicholas Lovrich, Faith Lutze, Otwin Marenin, Bryan Vila and Darryl Wood.

CRM J

403 **Violence Toward Women** 3 Prereq completion of one Tier I and three Tier II courses. Violence toward women and its relationship to broader social issues such as sexism and social control.

420 **Criminal Procedure** 3 Principal court decisions concerning standards of conduct and rights in the criminal process.

426 **Victimology and Public Policy** 3 Examination of victimization; policy responses to victims; victim's rights.

427 **Crime Prevention Strategies** 3 Personal, environmental, community-based and government crime prevention strategies and issues.

428 **Drug and Alcohol Use and Abuse** 3 Drug use, impact on behavior and drug control policies.

450 **Senior Seminar: Ethical Issues in Criminal Justice** 3 Examination of ethical issues in decision making in criminal justice.

468 **Addictive Behavior Across the Demographic Spectrum** 3 Prereq Psych 105, Soc 101 or Crm J 101. Same as Soc 468.

490 **Criminal Justice Internship** V 2 (0-6) to 12 (0-36) May be repeated for credit; cumulative maximum 12 hours. On/off-campus internship in criminal justice institutions (police, FBI, jails, law firms, etc.); written assignments and readings will be required.

499 **Special Problems** V 1 (0-3) to 4 (0-12) May be repeated for credit.

503 **Research Methods in Political Science and Criminal Justice** 3 Same as Pol S 503.

504 **Quantitative Methods in Political Science and Criminal Justice** 3 Prereq introductory statistics course. Same as Pol S 504.

505 **Comparative Criminal Justice** 3 Comparative study of crime laws and criminal justice systems in selected foreign countries.

530 **Criminal Justice: Process and Institutions** 3 Processes of criminal justice in the context of the social, political, and economic environments.

540 **Seminar in Evaluation Research** 3 Interrelationship of ideology, data, policy development, and policy implementation in public policy analysis.

541 **Seminar in Corrections** 3 Prereq Stat course. Current issues related to the control, management, and sanctioning of criminal offenders.

555 **Seminar in Criminological Theory** 3 Prereq graduate standing. Individual, situational and ecological correlates of criminal behavior; data sources and empirical research.

560 **Prosecution and Adjudication** 3 Prereq graduate standing. The function of courts and the behavior of prosecutors, defense attorneys and judges within the criminal justice system.

570 **The Police and Society** 3 Community and selected social institutional factors as related to their influence on police systems.

572 **Seminar in Comparative Policing** 3 Study of the history, organization, and policies of policing systems in selected countries and of transnational policing.

580 **Gender and Justice** 3 Criminal justice system's treatment of women offenders, victims, and professionals.

591 **Seminar in the Administration of Criminal Justice** 3 May be repeated for credit; cumulative maximum 6 hours. Current issues, problems, and critical concerns within the field of administration of criminal justice.

592 **Proseminar in Administration, Justice, and Applied Policy Studies** 3 May be repeated for credit; cumulative maximum 6 hours. Same as Pol S 542.

600 **Special Projects or Independent Study** V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 **Master's Research, Thesis, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 **Master's Special Problems, Directed Study, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 **Doctoral Research, Dissertation, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

Criminal Justice

Degree offered: Master of Arts in Criminal Justice

Faculty working with graduate students: 9

Graduate students: 12

Program offered: Pullman, Spokane

Deadline: Fall: January 10
Spring: July 1

Program Description

The Criminal Justice graduate program is designed to increase student understanding of the nature and causes of crime, the operation of the criminal justice system and its institutions, and the development and reform of criminal justice policy. Courses and research are grounded in theoretical foundations upon which students can learn to address real world problems. Emphasis is placed on understanding, designing, and conducting research from multiple perspectives to help students become educated policymakers, researchers, and scholars. Substantive emphases include criminal justice institutions and policies, the connections between criminal justice policies and public health, and comparative and international criminal justice. Courses are taught and research is conducted from an interdisciplinary perspective by a diversely educated graduate faculty.

Degree Description

The master of arts in criminal justice is designed to develop and enhance the student's knowledge of criminal justice; expand and develop a student's analytical and assessment skills; and further develop their facility with oral and written communication and with research.The program is flexible and provides a superb basis for entry into graduate work at the doctoral level or applied work in criminal justice agencies. Approximately 70% of our M.A. graduates are employed in applied settings while the balance have pursued teaching and research careers.

Faculty

David Brody, Laurie Drapela, Zachary Hamilton, Zachary Hays, Nicholas Lovrich, Faith Lutze, Otwin Marenin, Bryan Vila and Darryl Wood.

CRM J

403 Violence Toward Women 3 Prereq completion of one Tier I and three Tier II courses. Violence toward women and its relationship to broader social issues such as sexism and social control.

405 Comparative Criminal Justice Systems 3 Comparative study of criminal justice systems in the US and selected foreign countries.

420 Criminal Procedure 3 Principal court decisions concerning standards of conduct and rights in the criminal process.

424 Community Corrections 3 Prereq Crm J 150. Theory practice and human impact of treating criminal offenders in the community.

426 Victimology and Public Policy 3 Examination of victimization; policy responses to victims; victim's rights.

427 Crime Prevention Strategies 3 Personal, environmental, community-based and government crime prevention strategies and issues.

428 Drug and Alcohol Use and Abuse 3 Drug use, impact on behavior and drug control policies.

450 Senior Seminar: Ethical Issues in Criminal Justice 3 Examination of ethical issues in decision making in criminal justice.

468 Addictive Behavior Across the Demographic Spectrum 3 Prereq Psych 105, Soc 101 or Crm J 101. Same as Soc 468.

490 Criminal Justice Internship V 2 (0-6) to 12 (0-36) May be repeated for credit; cumulative maximum 12 hours. On/off-campus internship in criminal justice institutions (police, FBI, jails, law firms, etc.); written assignments and readings will be required.

499 Special Problems V 1 (0-3) to 4 (0-12) May be repeated for credit.

503 Research Methods in Political Science and Criminal Justice 3 Same as Pol S 503.

504 Quantitative Methods in Political Science and Criminal Justice 3 Prereq introductory statistics course. Same as Pol S 504.

505 Comparative Criminal Justice 3 Comparative study of crime laws and criminal justice systems in selected foreign countries.

530 Criminal Justice: Process and Institutions 3 Processes of criminal justice in the context of the social, political, and economic environments.

540 Seminar in Evaluation Research 3 Interrelationship of ideology, data, policy development, and policy implementation in public policy analysis.

541 Seminar in Corrections 3 Prereq Stat course. Current issues related to the control, management, and sanctioning of criminal offenders.

555 Seminar in Criminological Theory 3 Prereq graduate standing. Individual, situational and ecological correlates of criminal behavior; data sources and empirical research.

560 Prosecution and Adjudication 3 Prereq graduate standing. The function of courts and the behavior of prosecutors, defense attorneys and judges within the criminal justice system.

570 The Police and Society 3 Community and selected social institutional factors as related to their influence on police systems.

572 Seminar in Comparative Policing 3 Study of the history, organization, and policies of policing systems in selected countries and of transnational policing.

580 Gender and Justice 3 Criminal justice system's treatment of women offenders, victims, and professionals.

591 Seminar in the Administration of Criminal Justice 3 May be repeated for credit; cumulative maximum 6 hours. Current issues, problems, and critical concerns within the field of administration of criminal justice.

592 Proseminar in Administration, Justice, and Applied Policy Studies 3 May be repeated for credit; cumulative maximum 6 hours. Same as Pol S 542.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Criminal Justice

Degree offered: Master of Arts in Criminal Justice - Non Thesis

Faculty working with graduate students: 9

Graduate students: 12

Program offered: Pullman, Spokane

Tests required: GRE (Combined)

Deadline: Fall: January 10
Spring: July 1

Requirements

None

Program Description

The Criminal Justice graduate program is designed to increase student understanding of the nature and causes of crime, the operation of the criminal justice system and its institutions, and the development and reform of criminal justice policy. Courses and research are grounded in theoretical foundations upon which students can learn to address real world problems. Emphasis is placed on understanding, designing, and conducting research from multiple perspectives to help students become educated policymakers, researchers, and scholars. Substantive emphases include criminal justice institutions and policies, the connections between criminal justice policies and public health, and comparative and international criminal justice. Courses are taught and research is conducted from an interdisciplinary perspective by a diversely educated graduate faculty.

Degree Description

The master of arts in criminal justice is designed to develop and enhance the student's knowledge of criminal justice; expand and develop a student's analytical and assessment skills; and further develop their facility with oral and written communication and with research.The program is flexible and provides a superb basis for entry into graduate work at the doctoral level or applied work in criminal justice agencies. Approximately 70% of our M.A. graduates are employed in applied settings while the balance have pursued teaching and research careers.

Training and Professional Development Opportunities

Program evaluation, internships.

Post-Graduate Employment Opportunities

Federal law enforcement, secret service, IRS, Immigration and Customs, Homeland Security, corrections, Police and corrections planning and analysis.

Post-Graduate Career Placements

IRS, ICE, Naval Criminal Investigations, criminal justice leadership, police chief, sheriff, lawyer

Contact Information

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Faculty

David Brody, Laurie Drapela, Zachary Hamilton, Zachary Hays, Nicholas Lovrich, Faith Lutze, Otwin Marenin, Bryan Vila and Darryl Wood.

CRM J

503 **Research Methods in Political Science and Criminal Justice** 3 Same as Pol S 503.

504 **Quantitative Methods in Political Science and Criminal Justice** 3 Prereq introductory statistics course. Same as Pol S 504.

505 **Comparative Criminal Justice** 3 Comparative study of crime laws and criminal justice systems in selected foreign countries.

530 **Criminal Justice: Process and Institutions** 3 Processes of criminal justice in the context of the social, political, and economic environments.

540 **Seminar in Evaluation Research** 3 Interrelationship of ideology, data, policy development, and policy implementation in public policy analysis.

541 **Seminar in Corrections** 3 Prereq Stat course. Current issues related to the control, management, and sanctioning of criminal offenders.

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580 **Gender and Justice** 3 Criminal justice system's treatment of women offenders, victims, and professionals.

591 **Seminar in the Administration of Criminal Justice** 3 May be repeated for credit; cumulative maximum 6 hours. Current issues, problems, and critical concerns within the field of administration of criminal justice.

592 **Proseminar in Administration, Justice, and Applied Policy Studies** 3 May be repeated for credit; cumulative maximum 6 hours. Same as Pol S 542.

600 **Special Projects or Independent Study** V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 **Master's Research, Thesis, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 **Master's Special Problems, Directed Study, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 **Doctoral Research, Dissertation, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

Crop Science

Degree offered: Doctor of Philosophy (Crop Science)

Faculty working with graduate students: 75

Graduate students: 35

Graduate students receiving assistantships or scholarships: 80%

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

Fifteen hours of 500-level grade coursework are required; not included but required are 2 credits of Crops 510 Seminar and 1 credit of Crops 512 State Tour. Two credits of Crops 511 Research Proposal and Development are also required (S/F grading). No more than half of the graded credit may be transfer credit. Seventy-two credits are required for the degree.

Program Description

The Department of Crop and Soil Sciences at Washington State University department offers M.S. and Ph.D. programs in Crop Science, with the ability to conduct graduate research in a variety of specialized areas within each discipline. Current research in Crop Science is being conducted in the areas of plant breeding and genetics, molecular genetics, crop production, turf management, weed science, plant physiology, and cereal chemistry. We work with wheat, forages, barley, grain legumes, brassicas and turf. We have several research projects conducted in cooperation with the United States Department of Agriculture (USDA) through the USDA Agricultural Research Service (USDA-ARS) and USDA Natural Resources Conservation Service (USDA-NRCS) in addition to research projects being conducted in association with other universities. Research facilities include state of the art laboratories and greenhouse facilities, and research farms located in Pullman, as well as throughout the state at five Research and Extension Centers. Graduate students learn valuable skills and knowledge working side by side with faculty members and research technicians providing them the opportunity to play an integral role in the advancement of their major advisor's research. Students also have the opportunity to gain leadership, communication, and instructional experience through the option of serving as teaching assistants for one or more courses within their discipline. Qualified students typically receive competitive teaching or research assistantships. These assistantships provide non-resident and resident tuition waivers, paid health insurance, and stipends to help cover living expenses.

Degree Description

Training and Professional Development Opportunities

Students have the opportunity to gain leadership, communication, and instructional experience through the option of serving as teaching assistants for one or more courses within their discipline. Extension program delivery, and Graduate School teacher training and grant proposal writing workshop opportunities are also available.

Post-Graduate Employment Opportunities

Crop scientists with advanced degrees may find employment in government agencies, national labs, academia, private business, agricultural consulting, and international agriculture.

Contact Information

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BIOL

519 **Introduction to Population Genetics** 3 Prereq Biol 301. Survey of basic population and quantitative genetics.

520 **Conservation Genetics** 2 Prereq Biol 301. Genetic studies and approaches relevant to efforts to conserve threatened and endangered populations of organisms.

521 **Quantitative Genetics** 3 Prereq Biol 519 or permission of instructor. Fundamentals of quantitative genetics; evolutionary quantitative genetics.

548 **Evolutionary Ecology of Populations** 3 Evolutionary dynamics of natural populations and the co-evolution of species.

CROPS

301 **Turfgrass Management** 3 (2-3) Prereq one semester of Biology or Horticulture. Principles of establishment and management of turf for lawns, parks, and golf courses. Field trip required.

302 **Forage Crops** 3 (2-3) Prereq Biol 106 or 120. Adaptation, production, and utilization of forage crops. Field trip required.

305 **Ecology and Management of Weeds** 3 (2-3) Prereq Biol 106; Biol 120; CropS/Hort 102; CropS/Hort 202. Weed ecology/management in crop and non-crop systems; weed growth/development, identification, weed control (chemical, mechanical, biological), and environmental issues

317 **Turfgrass Management Environmental Issues** 3 Prereq CropS 301. Turfgrass management and practices relating to environmental issues and concerns for golf courses, athletic fields and other public areas.

360 **World Agricultural Systems** 3 Prereq two semesters physical or biological sciences. Study of agro-environmental characteristics of world agriculture; historical and contemporary features of world food production.

401 **Turfgrass Science** 3 Prereq CropS 301. Integration of the principles of turfgrass science into turf management for environmental stewardship of turfgrass systems.

403 **Advanced Cropping Systems** 3 Prereq CropS 201; Pl P 429 or c//; or graduate standing. Understanding the management of constraints to crop production and quality; biological, physical, and chemical approaches to crop health management. Field trips required. Credit not granted for both CropS 403 and 503.

411 **Crop Environment Interactions** 3 Prereq Hort 202. Effects of environment and management on crop growth and development.

412 **Seminar** 1 May be repeated for credit. Current literature and reports on research or special topics.

425 **Crop Biotechnology** 3 Prereq introductory biology. Science, techniques and potential concerns underlying the genetic modification of plants.

443 **Plant Breeding for Organic Agriculture** 3 Prereq Crops/Hort 202; Biol 106 or 120. Concepts and practice of breeding in and for organic agriculture with an emphasis on field-based, on-farm techniques.

444 **Plant Breeding I** 2 Prereq Biol 106, 120, CropS 202, or Hort 202. Genetic principles underlying plant breeding and an introduction to plant breeding.

445 **Plant Breeding II** 2 Prereq Crops/Hort 444 or MBioS 301. Principles and practices of plant breeding.

495 **Research Experience** V 1-4 May be repeated for credit; cumulative maximum 12 hours. Planned and supervised undergraduate research experience.

497 **Special Topics: Study Abroad** V 1-15 May be repeated for credit.

498 **Professional Internship** V 1 (0-3) to 6 (0-18) May be repeated for credit; cumulative maximum 9 hours. Planned and supervised professional work experience.

499 **Special Problems** V 1 (0-3) to 4 (0-12) May be repeated for credit.

503 **Advanced Cropping Systems** 3 Prereq CropS 201; Pl P 429 or c//; or graduate standing. Graduate-level counterpart of CropS 403; additional requirements. Credit not granted for both CropS 403 and 503.

504 **Plant Transmission Genetics** 3 Prereq MBioS 301. Transmission of genes across generations; detailed study of the basic laws of genetics to predict and describe inheritance.

505 **Advanced Classical and Molecular Breeding** 3 Prereq Biol 320 or MBioS 303; CropS 445. Characterization and principles of improving crop quality and adaptation traits with emphasis on molecular breeding strategies.

510 **Seminar** 1 May be repeated for credit. Literature review; preparation and presentation of reports in crop science.

511 **Research Proposal and Development** 2 Develop research proposal and give oral presentation to demonstrate ability to employ strategy and procedures to address objectives.

512 **Topics in Crop Science** V 1-2 May be repeated for credit. Concepts of plant breeding, seed physiology, and technology; crop physiology and management.

513 **Biology of Weeds** 3 Prereq graduate standing. Biology, ecology, and physiology of weeds; crop and weed interactions and interference.

520 **Plant Cytogenetic Techniques** 3 (2-4) Prereq MBioS 301. Techniques to study plant genes and chromosomes. Two lec and 4 hrs of lab a wk. (Alt/yrs).

554 Chromosome Structure and Function 3 Prereq MBioS 301 or equivalent. Structural and functional organization of eukaryotic chromosomes.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

MATH

566 Optimization in Networks 3 Prereq graduate standing; Math 325 or 364, or knowledge of linear programming. Graduate-level counterpart of Math 466; additional requirements. Credit not granted for both Math 466 and 566.

MBIOS

303 Introductory Biochemistry 4 Prereq Chem 106; Chem 345. Modern biochemistry for undergraduates in the biological sciences.

513 General Biochemistry I 3 Prereq MBioS 303, graduate standing. Graduate-level counterpart of MBioS 413; additional requirements. Credit not granted for both MBioS 413 and 513.

514 General Biochemistry 3 Prereq MBioS 413, or graduate standing. Graduate-level counterpart of MBioS 414; additional requirements. Credit not granted for both 414 and 514.

PL P

521 General Mycology 4 (2-6) The structure, life histories, classification, and economic importance of the fungi.

525 Field Plant Pathology and Mycology V 1 (0-3) to 2 (0-6) May be repeated for credit; cumulative maximum 4 hours. Field trips, forays, and demonstrations dealing with various aspects of plant pathology and mycology.

535 Molecular Genetics of Plant and Pathogen Interactions 3 Prereq MBioS 301, 303. Genetic and molecular biological aspects of host-pathogen interactions.

SOILS

413 Soil and Environmental Physics 3 (2-3) Prereq Math 107; Geol 101, 102 or SoilS 201. Physical properties of soils and their relationships to moisture, aeration, and temperature, plant-soil-atmospheric relationships, solute transport and soil salinity.

547 Soil Fertility Management 3 Prereq SoilS 441. Philosophy of fertilizer recommendations based on soil and plant tissue testing; principles of fertilizer manufacture, placement and use.

STAT

412 Statistical Methods in Research I 3 Prereq Stat 212, Math 140, 171, 202, or graduate standing. Intermediate statistical methods, design and analysis of research studies: completely randomized and randomized block designs, multiple regression, categorical data analysis.

512 Statistical Methods in Research II 3 (2-2) Prereq Stat 412 or equivalent. Analysis and interpretation of designed experiments: CRD, RCBD, spit-plot and repeated measures, multiple comparisons, multiple regression modeling, validation of assumptions.

519 Applied Multivariate Analysis 3 Prereq MgtOp 591 or Stat 443. Same as MgtOp 519.

Crop Science

Degree offered: Master of Science in Crop Science

Faculty working with graduate students: 75

Graduate students: 35

Graduate students receiving assistantships or scholarships: 80%

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

Twenty-one hours of graded credit are required, including seminar and state-wide tour. Twenty-six credits are required overall.

Program Description

The Department of Crop and Soil Sciences at Washington State University department offers M.S. and Ph.D. programs in Crop Science, with the ability to conduct graduate research in a variety of specialized areas within each discipline. Current research in Crop Science is being conducted in the areas of plant breeding and genetics, molecular genetics, crop production, turf management, weed science, plant physiology, and cereal chemistry. We work with wheat, forages, barley, grain legumes, brassicas and turf. We have several research projects conducted in cooperation with the United States Department of Agriculture (USDA) through the USDA Agricultural Research Service (USDA-ARS) and USDA Natural Resources Conservation Service (USDA-NRCS) in addition to research projects being conducted in association with other universities. Research facilities include state of the art laboratories and greenhouse facilities, and research farms located in Pullman, as well as throughout the state at five Research and Extension Centers. Graduate students learn valuable skills and knowledge working side by side with faculty members and research technicians providing them the opportunity to play an integral role in the advancement of their major advisor's research. Students also have the opportunity to gain leadership, communication, and instructional experience through the option of serving as teaching assistants for one or more courses within their discipline. Qualified students typically receive competitive teaching or research assistantships. These assistantships provide non-resident and resident tuition waivers, paid health insurance, and stipends to help cover living expenses.

Degree Description

Training and Professional Development Opportunities

Students have the opportunity to gain leadership, communication, and instructional experience through the option of serving as teaching assistants for one or more courses within their discipline. Extension program delivery, and Graduate School teacher training and grant proposal writing workshop opportunities are also available.

Post-Graduate Employment Opportunities

Crop scientists with advanced degrees may find employment in government agencies, national labs, academia, private business, agricultural consulting, and international agriculture.

Contact Information

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Faculty

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BIOL

519 **Introduction to Population Genetics** 3 Prereq Biol 301. Survey of basic population and quantitative genetics.

520 **Conservation Genetics** 2 Prereq Biol 301. Genetic studies and approaches relevant to efforts to conserve threatened and endangered populations of organisms.

521 **Quantitative Genetics** 3 Prereq Biol 519 or permission of instructor. Fundamentals of quantitative genetics; evolutionary quantitative genetics.

548 **Evolutionary Ecology of Populations** 3 Evolutionary dynamics of natural populations and the co-evolution of species.

566 **Mathematical Genetics** 3 Prereq graduate standing. Same as Math 563.

CROPS

301 **Turfgrass Management** 3 (2-3) Prereq one semester of Biology or Horticulture. Principles of establishment and management of turf for lawns, parks, and golf courses. Field trip required.

302 **Forage Crops** 3 (2-3) Prereq Biol 106 or 120. Adaptation, production, and utilization of forage crops. Field trip required.

305 **Ecology and Management of Weeds** 3 (2-3) Prereq Biol 106; Biol 120; CropS/Hort 102; CropS/Hort 202. Weed ecology/management in crop and non-crop systems; weed growth/development, identification, weed control (chemical, mechanical, biological), and environmental issues

317 **Turfgrass Management Environmental Issues** 3 Prereq CropS 301. Turfgrass management and practices relating to environmental issues and concerns for golf courses, athletic fields and other public areas.

360 **World Agricultural Systems** 3 Prereq two semesters physical or biological sciences. Study of agro-environmental characteristics of world agriculture; historical and contemporary features of world food production.

401 **Turfgrass Science** 3 Prereq CropS 301. Integration of the principles of turfgrass science into turf management for environmental stewardship of turfgrass systems.

403 **Advanced Cropping Systems** 3 Prereq CropS 201; Pl P 429 or c//; or graduate standing. Understanding the management of constraints to crop production and quality; biological, physical, and chemical approaches to crop health management. Field trips required. Credit not granted for both CropS 403 and 503.

411 **Crop Environment Interactions** 3 Prereq Hort 202. Effects of environment and management on crop growth and development.

412 **Seminar** 1 May be repeated for credit. Current literature and reports on research or special topics.

425 **Crop Biotechnology** 3 Prereq introductory biology. Science, techniques and potential concerns underlying the genetic modification of plants.

443 **Plant Breeding for Organic Agriculture** 3 Prereq Crops/Hort 202; Biol 106 or 120. Concepts and practice of breeding in and for organic agriculture with an emphasis on field-based, on-farm techniques.

444 **Plant Breeding I** 2 Prereq Biol 106, 120, CropS 202, or Hort 202. Genetic principles underlying plant breeding and an introduction to plant breeding.

445 **Plant Breeding II** 2 Prereq Crops/Hort 444 or MBioS 301. Principles and practices of plant breeding.

495 **Research Experience** V 1-4 May be repeated for credit; cumulative maximum 12 hours. Planned and supervised undergraduate research experience.

497 **Special Topics: Study Abroad** V 1-15 May be repeated for credit.

498 **Professional Internship** V 1 (0-3) to 6 (0-18) May be repeated for credit; cumulative maximum 9 hours. Planned and supervised professional work experience.

499 **Special Problems** V 1 (0-3) to 4 (0-12) May be repeated for credit.

503 **Advanced Cropping Systems** 3 Prereq CropS 201; Pl P 429 or c//; or graduate standing. Graduate-level counterpart of CropS 403; additional requirements. Credit not granted for both CropS 403 and 503.

504 **Plant Transmission Genetics** 3 Prereq MBioS 301. Transmission of genes across generations; detailed study of the basic laws of genetics to predict and describe inheritance.

505 **Advanced Classical and Molecular Breeding** 3 Prereq Biol 320 or MBioS 303; CropS 445. Characterization and principles of improving crop quality and adaptation traits with emphasis on molecular breeding strategies.

510 **Seminar** 1 May be repeated for credit. Literature review; preparation and presentation of reports in crop science.

511 **Research Proposal and Development** 2 Develop research proposal and give oral presentation to demonstrate ability to employ strategy and procedures to address objectives.

512 **Topics in Crop Science** V 1-2 May be repeated for credit. Concepts of plant breeding, seed physiology, and technology; crop physiology and management.

513 **Biology of Weeds** 3 Prereq graduate standing. Biology, ecology, and physiology of weeds; crop and weed interactions and interference.

520 **Plant Cytogenetic Techniques** 3 (2-4) Prereq MBioS 301. Techniques to study plant genes and chromosomes. Two lec and 4 hrs of lab a wk. (Alt/yrs).

554 **Chromosome Structure and Function** 3 Prereq MBioS 301 or equivalent. Structural and functional organization of eukaryotic chromosomes.

600 **Special Projects or Independent Study** V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 **Master's Research, Thesis, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

MATH

566 Optimization in Networks 3 Prereq graduate standing; Math 325 or 364, or knowledge of linear programming. Graduate-level counterpart of Math 466; additional requirements. Credit not granted for both Math 466 and 566.

MBIOS

303 Introductory Biochemistry 4 Prereq Chem 106; Chem 345. Modern biochemistry for undergraduates in the biological sciences.

513 General Biochemistry I 3 Prereq MBioS 303, graduate standing. Graduate-level counterpart of MBioS 413; additional requirements. Credit not granted for both MBioS 413 and 513.

514 General Biochemistry 3 Prereq MBioS 413, or graduate standing. Graduate-level counterpart of MBioS 414; additional requirements. Credit not granted for both 414 and 514.

PL P

521 General Mycology 4 (2-6) The structure, life histories, classification, and economic importance of the fungi.

525 Field Plant Pathology and Mycology V 1 (0-3) to 2 (0-6) May be repeated for credit; cumulative maximum 4 hours. Field trips, forays, and demonstrations dealing with various aspects of plant pathology and mycology.

535 Molecular Genetics of Plant and Pathogen Interactions 3 Prereq MBioS 301, 303. Genetic and molecular biological aspects of host-pathogen interactions.

SOILS

413 Soil and Environmental Physics 3 (2-3) Prereq Math 107; Geol 101, 102 or SoilS 201. Physical properties of soils and their relationships to moisture, aeration, and temperature, plant-soil-atmospheric relationships, solute transport and soil salinity.

547 Soil Fertility Management 3 Prereq SoilS 441. Philosophy of fertilizer recommendations based on soil and plant tissue testing; principles of fertilizer manufacture, placement and use.

STAT

412 Statistical Methods in Research I 3 Prereq Stat 212, Math 140, 171, 202, or graduate standing. Intermediate statistical methods, design and analysis of research studies: completely randomized and randomized block designs, multiple regression, categorical data analysis.

512 Statistical Methods in Research II 3 (2-2) Prereq Stat 412 or equivalent. Analysis and interpretation of designed experiments: CRD, RCBD, spit-plot and repeated measures, multiple comparisons, multiple regression modeling, validation of assumptions.

519 Applied Multivariate Analysis 3 Prereq MgtOp 591 or Stat 443. Same as MgtOp 519.

Crop Science

Degree offered: Master of Science in Crop Science - Non Thesis

Faculty working with graduate students: 75

Graduate students: 35

Graduate students receiving assistantships or scholarships: 80%

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

Twenty-six hours of graded coursework are required, including seminar and state-wide tour. Thirty hours are required overall.

Program Description

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Degree Description

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Students have the opportunity to gain leadership, communication, and instructional experience through the option of serving as teaching assistants for one or more courses within their discipline. Extension program delivery, and Graduate School teacher training and grant proposal writing workshop opportunities are also available.

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519 Applied Multivariate Analysis 3 Prereq MgtOp 591 or Stat 443. Same as MgtOp 519.

Design

Degree offered: Doctor of Design

Faculty working with graduate students: 17

Graduate students: 20

Graduate students receiving assistantships or scholarships: 50%

Program offered: Spokane

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal), IELTS, TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

Research ProposalFinal Exam/Dissertation Defense

Program Description

The Doctor of Design (D. Des) is offered through the Interdisciplinary Program at the Interdisciplinary Design Institute, Washington State University Spokane. The D. Des is a unique doctoral degree, on the same level of intellectual rigor as the PhD, but designed expressly for integrating cross-disciplinary research towards design applications. The D. Des addresses a demonstrated void in design education by specifically bridging education, research, and practice within a philosophical and pedagogical framework of interdisciplinary inquiry and critical synthesis. For the purposes of this degree, "design" is broadly defined as the creative integration of disparate components of knowledge, resources, and experience towards an applied outcome that contributes to socio-cultural well-being.The D. Des educates students so that they will become more valuable to academic, business, and government organizations that require greater artistic, scientific and investigative skills. It provides candidates with opportunities to develop and deepen their education in three important ways:* Enhancing research and analytical skills with rigorous methods that are employed within the pedagogy of design-oriented investigation, critical synthesis, and problem-solving;*

Acquiring advanced knowledge specific to their area(s) of inquiry through comprehensive scholarly investigations and distinguishing documentation;* Developing critical design and synthesis process skills in the context of interdisciplinarity.The program goals are three fold-interdisciplinary, disciplinary, and community. The D. Des contributes to the collaboration and critical assessment of the relationships among the design disciplines. Improved understanding of these relationships will support the ability of the design professions to undertake and solve complex and interrelated social and environmental design problems. Interdisciplinarity is one of the distinguishing characteristics of the program-giving candidates a broader knowledge and skill base.Concurrent to the interdisciplinary focus of the program is the development of specific disciplinary goals designed to deepen knowledge and investigative methodologies inherent in and supportive of each of the design professional fields. Each candidate will apply the appropriate philosophical, technical and/or synthetic focus to their study and will develop critical content to their research contributing in innovative and original ways.The program seeks to educate students so that they can contribute in teaching, design and/or community service. While some of the academic work will be theoretical in nature, the program will emphasize application within the context of the built and natural environments as well as a specific area of concentration.More information about the program plan is located in our graduate handbook (which is linked from http://spokane.wsu.edu/academics/design/doctor/). We do not accept spring applications for this degree. 1000 Character Limit.

Degree Description

The Doctor of Design (D. Des) is offered through the Interdisciplinary Program at the Interdisciplinary Design Institute, Washington State University Spokane. The D. Des is a unique doctoral degree, on the same level of intellectual rigor as the PhD, but designed expressly for integrating cross-disciplinary research towards design applications. The D. Des addresses a demonstrated void in design education by specifically bridging education, research, and practice within a philosophical and pedagogical framework of interdisciplinary inquiry and critical synthesis. For the purposes of this degree, "design" is broadly defined as the creative integration of disparate components of knowledge, resources, and experience towards an applied outcome that contributes to socio-cultural well-being.Concurrent to the interdisciplinary focus of the program is the develop-

ment of specific disciplinary goals designed to deepen knowledge and investigative methodologies inherent in and supportive of each of the design professional fields. Each candidate will apply the appropriate philosophical, technical and/or synthetic focus to their study and will develop critical content to their research contributing in innovative and original ways.

Training and Professional Development Opportunities

Participation in teaching and/or research assistantships; scholarly development through publications and conference presentations; workshops in teaching and writing grants; DES-IGN Association; Charette leadership; Design Research Conference

Post-Graduate Employment Opportunities

The program seeks to educate students so that they can contribute in teaching, design and/or community service. While some of the academic work will be theoretical in nature, the program will emphasize application within the context of the built and natural environments as well as a specific area of concentration.

Contact Information

Jaime Rice
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Interdisciplinary Design Institute
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Spokane, WA 99208
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Nancy Blossom
Professor & Director
Interdisciplinary Design Program
PO Box 1495
Spokane, WA 99210-1495
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E-mail: blossom@wsu.edu

Faculty

John Abell, Carol Allen, Celestina Barbosa-Leiker, Nancy Blossom, Kerry Brooks, Frederick Ford, Jason Gruen, Jolie Kaytes, Janetta McCoy, Matthew Melcher, Taiji Miyasaka, John Roll, Jeffrey Sanders, Bob Scarfo, John Turpin, Catherine Van Son and David Wang.

ARCH

520 Directed Topics in Architecture V 1-3 May be repeated for credit; cumulative maximum 6 hours. Topics related to areas of emphasis in the program and student specialization.

525 History and Theory 3 Prereq graduate standing; Arch 409. History and theory of 20th century architecture focusing on cultural and philosophical principles related to design.

560 Interdisciplinary Seminar 3 Prereq graduate standing. Explores approaches to design thinking in the topic areas of people and place, history, theory and criticism, and physical design.

DESGN

561 Seminar in Design Thinking 3 Prereq doctoral standing. Understanding "design thinking" or "design knowing" and translating research and theory into practice.

562 Area Readings 3 Prereq Doctoral standing. Forum for the advancement of understanding and discussion of readings related to interdisciplinary design.

563 Directed Readings 3 Prereq Desgn 562. Advanced critical and comprehensive reviews of literature pertinent to student's focus area; development of specialization and expertise in identified area.

564 Design Research Methods 4 Prereq c// in Desgn 565. Development and preparation of research proposals; identification of theories, exploration of research methods and strategies; development of thesis statement and literature review.

565 Dissertation Proposal Planning 2 Prereq doctoral standing and c// Desgn 564. Write and present independent research proposal based on work in Desgn 564 to prospective doctoral committee members.

570 Research Practicum 3 Prereq Doctoral standing; Desgn 564; Desgn 565. Interdisciplinary research in design; focus on development and application of individual research.

598 Topics in Design V 1-3 May be repeated for credit; cumulative maximum 9 hours. Prereq doctoral student. Topical issues in design responding to the shifting demands and needs of the design professions.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

EDPSY

508 Educational Statistics 3 Prereq EdPsy 505. Introductory course for graduate students in applied statistics for the behavioral sciences.

EDRES

563 Principles of Research 3 Prereq CoPsy 501 or EdRes 562 . The centrality of literature review and the understanding of methods used in educational research; practice in designing research questions.

Landscape Architecture

L A

525 Landscape Modeling 3 (1-6) Prereq L A 477. Visual and cartographic landscape modeling through application of GIS and visualization technologies to landscape changes.

Early Childhood Leadership and Administration - Cert in Early Chldhood Ldr Adm

Degree offered: Graduate Certificate in Early Childhood Leadership and Administration

Requirements

Please see the program/department for more information.

Economics

Degree offered: Doctor of Philosophy (Economics)

Faculty working with graduate students: 22

Graduate students: 68

Graduate students receiving assistantships or scholarships: 44%

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal), TOEFL

Deadline: Fall: January 10

Requirements

Must succesfully complete three preliminary core exams (end of first year)Written Doctoral Examination Research Proposal and SeminarMust complete two fieldsMust complete one additional course elective

Program Description

The PhD in Economics is designed to prepare students for careers as professional economists in academia, government, and the private sector.

Degree Description

The PhD in Economics is designed to prepare students for careers as professional economists in academia, government, and

the private sector. The program is structured so that a student with a Bachelor of Arts degree in Economics and an appointment as a graduate assistant should be able to complete the required coursework within three academic years, excluding summer sessions. Students with a Master of Arts in Applied Economics degree may be able to complete the required coursework in less time, depending on the content and quality of the previous work. The length of time required to complete the dissertation varies greatly but students usually complete the entire program, including the dissertation, within four years.

Training and Professional Development Opportunities

None

Post-Graduate Employment Opportunities

Professional Economists in academia, government, and the private sector

Post-Graduate Career Placements

Health Research Scientist, Texas A&MAssistant Professor, Eastern Washington UniversityEconomist and Research Fellow, Center for Disease Control in Atlanta

Contact Information

Dr. Hayley Chouinard
Associate Professor
School of Economic Sciences
PO Box 646210
Hulbert Hall 101
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Telephone: 509-335-8739
Fax: 509-335-1173
E-mail: chouinard@wsu.edu

Faculty

Raymond Batina, Kenneth Casavant, Andrew Cassey, Seung Choi, Hayley Chouinard, Benjamin Cowan, Ana Espinola-Arredondo, Gregmar Galinato, Rosa Gallardo, Mark Gibson, Bidisha Mandal, Thomas Marsh, Jill McCluskey, Vicki McCracken, R Mittelhammer, Felix Munoz-Garcia, Joseph Neibergs, Robert Rosenman, C Shumway, Philip Wandschneider, Jia Yan and Jonathan Yoder.

ECONS

500 Macroeconomic Theory I 3 Prereq EconS 302; one year of calculus. Introduction to dynamics, growth and investment, overlapping generations models, Ramsey model, consumption and investment.

501 Microeconomic Theory I 3 Prereq EconS 301 or 305; one year calculus. Microeconomic theory, multivariate optimization, consumer and producer theory, competitive partial equilibrium, introduction to imperfect competition.

502 Macroeconomic Theory II 3 Prereq EconS 500. Macroeconomic theory, short-run fluctuations and nominal rigidities, monetary economics and inflation, real business cycle models, unemployment international macroeconomics.

503 Microeconomic Theory II 3 Prereq EconS 501. General equilibrium, welfare economics and social choice, market failure, game theory, economics of information.

504 Production and Consumption Economics 3 Prereq EconS 502; EconS 503. Advanced duality topics, demand and supply system modeling, financial economics and risk.

510 Statistics for Economists 3 Prereq college calculus and matrix algebra. Statistical theory underlying econometric techniques utilized in quantitative analysis of problems in economics and finance.

511 Econometrics I 3 Prereq EconS 510. Single equation linear and nonlinear models; estimation, inference, finite and asymptotic properties, effects and mitigation of violations of classical assumptions.

512 Econometrics II 3 Prereq EconS 501; EconS 511. Econometric methods for systems estimation; simultaneous equations, discrete and limited dependent variable, panel data, and time series data.

513 Econometrics III 3 Prereq EconS 502; EconS 503; EconS 512. Linear and non-linear models and maximum likelihood estimation and inference; semi-parametric and parametric methods; limited dependent variable models.

514 Econometrics IV 3 Prereq EconS 502; EconS 503; EconS 513. Constrained estimation, testing hypotheses, bootstrap resampling, BMM estimation and inference, nonparametric regression analysis, and an introduction to Bayesian econometrics.

521 Topics in Economic Sciences V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq EconS 301; EconS 302; EconS 311. Current topics in the development and application of the economic sciences.

525 Master's Econometrics 3 Prereq 3 hours in statistics. Theory and practice of multiple regression methods; applications to the study of economic and other phenomena; use of computer regression programs.

526 Master's Microeconomic Analysis 3 Prereq EconS 301 or 305; Math 171 or 202. Masters-level, calculus-based producer and consumer theory with selected managerial economics topics.

527 Mathematics for Economists 3 Prereq graduate standing. Mathematical methods applicable to economic analysis and research.

529 Research Methods V 1-2 May be repeated for credit; cumulative maximum 3 hours. Prereq graduate standing. Prepare and communicate professional-quality research with an emphasis on learning how to identify, develop, write, and present research.

531 Economic Analysis of Environmental Policies 3 Prereq EconS 301; EconS 311; EconS 330. Graduate-level counterpart of EconS 431; additional requirements. Credit not granted for both EconS 431 and 531.

532 Natural Resource Economics and Policy 3 Prereq EconS 301 or permission of instructor. Graduate-level counterpart of EconS 432; additional requirements. Credit not granted for both EconS 432 and 532.

533 International Trade and Policy 3 Prereq graduate standing. International trade theories, policies, and research issues related to world trade with emphasis on agricultural commodity markets.

534 Production Economics 3 Prereq EconS 526. Production economics theory and methods applied to problems of production response, economic optimization, technology, policy, risk and dynamics.

535 Applied Industrial Organization 3 Economic and strategic management theories and their relevance to agribusiness decision-making including empirical applications.

555 Managerial Economics for Decision Making 3 Prereq admission to MBA program. Optimal economic decision making for business in a global environment. Not open to economics graduate students.

571 International Trade 3 Prereq EconS 502; EconS 503; EconS 511. Recent developments in trade theory and policy, including international factor movements, empirical analysis of trade flows and strategic trade policies.

572 International Development 3 Prereq EconS 502; EconS 503; EconS 511. Structural and two-sector growth models of developing countries and countries in transition; empirical estimation of sources of growth.

581 Natural Resource Economics 3 Prereq EconS 502; EconS 503; EconS 511. Economic dynamics of natural resource systems.

582 Environmental Economics 3 Prereq EconS 502; EconS 503; EconS 511. Economic theory for environmental issues; externalities, property rights, and welfare analysis; policy design and implementation; non-market valuation and cost/benefit analysis.

583 Public Sector Economics 3 Prereq EconS 502; EconS 503; EconS 511. Public sector and public choice economics, including government debt and tax policy, public decision making, bureaucratic behavior and rent-seeking, with applications.

593 Applications in Microeconomic Topics 3 Prereq EconS 502, 503, 511. Applied topics in healthcare, sports, transportation and other markets.

594 Theory of Industrial Organization 3 Prereq EconS 502, 503, 511. Theory of market structure and firm behavior, including price and non-price competition, information and strategic behavior, and technological change.

596 Advanced Topics in Financial Economics V 1-6 May be repeated for credit; cumulative maximum 12 hours. Prereq EconS 500; EconS 501. Same as Fin 596.

598 PhD Research Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Prereq graduate standing. Seminar focusing on PhD students presenting their own research and critically assessing the research of other PhD students.

599 Special Topics in Economics 3 Prereq graduate standing.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Educational Leadership - Educational Administration

Degree offered: Doctor of Education

Faculty working with graduate students: 14

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal)

Deadline: Fall: January 10
Spring: September 1

Program Description

WSU's Educational Leadership program offers graduate studies at the masters and doctoral levels and administrator certification programs for the superintendent, residency principal, and residency program administrator certificates. The masters (M.A. and Ed.M.) and doctoral (Ed.D. and Ph.D.) degree programs offer specializations in K-12 educational leadership.Program faculty are dedicated to meeting students' needs as current and future K-12 educational leaders and to preparing future professors for work in academia. The program provides a balance and integration of practical experience, theory, and research and aims to prepare educational leaders who function as scholar-practitioners.Educational leadership programs are offered at all of WSU's campuses (Pullman, Spokane, Tri-Cities, and Vancouver). All campuses offer the Educational Leadership masters degrees, certification programs, and access to the statewide doctor of education degree (Ed.D.). One-year residency at the Pullman campus is required for the doctor of philosophy degree (Ph.D.).WSU's Educational Leadership program is one of 70 doctoral-granting programs nationwide selected for membership in the University Council for Educational Administration, a national consortium dedicated to the improvement of educational leadership preparation and practice. WSU's graduate students have the opportunity to participate in UCEA's annual convention and other professional activities.WSU's administrator certification programs are organized around the national ISLLC (Interstate School Leaders Licensure Consortium) standards, which have been adopted as the certification standards for Washington State licensure.. WSU's innovative cohort-based and field-based certification programs for principals and superintendents promote a close professional network. Faculty members for certification programs have extensive experience as school principals and/or central office administrators.

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The education administration program offers graduate studies at the master's and doctoral levels, plus administrator certification programs for the superintendent, residency principal, and residency program administrator certificates. The master's (M.A. and Ed.M.) and doctoral (Ed.D. and Ph.D.) degree programs offer a specialization in K-12 educational leadership. Program faculty provide a balance and integration of practical experience, theory, and research and aim to prepare educational leaders who function as scholar-practitioners. All campuses offer the educational leadership master's degrees, certification programs, and access to the state-wide doctor of education degree; one-year residency is required for the doctor of philosophy degree. The University's educational leadership program is one of 70 doctoral-granting programs nationwide selected for membership in the University Council for Educational Administration, a national consortium dedicated to the improvement of educational leadership preparation and practice. The administrator certification programs are organized around the national ISLLC (Interstate School Leaders Licensure Consortium) standards, which have been adopted as the certification standards for Washington State licensure. The goal of these standards and our programs is to prepare educational leaders who can provide effective leadership to promote learning for all children in K-12 schools. Washington State University's innovative field-based principal and superintendent certification programs serve certification candidates in a cohort-based program that promotes a close professional network.

Training and Professional Development Opportunities

None

Post-Graduate Employment Opportunities

None

Post-Graduate Career Placements

None

Contact Information

Graduate Coordinator
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Washington State University
Cleveland Hall 252
PO Box 642114
Pullman, WA 99163-2114
Telephone: 509-335-9195
Fax: 509-335-2097
E-mail: gradstudies@wsu.edu

Faculty

Michele Acker-Hocevar, Gail Furman, Gordon Gates, Paul Goldman, James Howard, Kristin Huggins, Joan Kingrey, Chad Lochmiller, Forrest Parkay, Dennis Ray, Nancy Sanders, Gay Selby, Gene Sharratt and Danny Talbot.

ED AD

501 Philosophy of Education 3 Development of American educational philosophy.

503 Values and Ethics for Educational Leaders 3 Study of ethical theories, the moral dilemmas of public schooling, and the skills of ethical reasoning; professional code of ethics.

506 Social Context of Education 2 The interpretation of social context issues including historical, legal and cultural factors as these influence policies and practice in education.

507 Social Foundations of Education 3 Educational adaptations to the economic and social trends and forces.

510 Improvement of Instruction 3 Analysis and evaluation of instructional models with emphasis on information processing; implications for changing teaching style.

514 Basic Principles of Curriculum Design V 2-3 The application of theoretical concepts and approaches in the planning and design of curricula.

515 Curriculum Implementation 3 Research and practice; innovation and change in curricular organization emphasizing implementation.

516 Instructional and Curricular Leadership V 2-3 Theory, research, and practice of providing instructional and curricular leadership in schools and other educational settings.

518 Media Literacy and Educational Technology 3 Relates research and theory of media literacy to instructional resources and current leadership practices; problems of planning and administering programs.

520 Seminar in Curriculum and Instruction V 2-3 Contemporary issues, analyses and developments of educational programs.

521 Topics in Education V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and/or applications in selected areas of education.

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537 Advanced Qualitative Research in Education 3 Prereq EdRes 564. Advanced theory and methods of qualitative research; theoretical foundations, data collection and analysis, and reporting.

538 Special Topics in Qualitative Research in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq Ed Ad 536. May be repeated for credit; cumulative maximum 6 hours.

560 Student Personnel Services in Higher Education 2 or 3 Philosophy, structure, functions, and organization of student affairs administration.

561 Introduction to College Student Development 3 Student development theory, related research and the application of theory to practice in student affairs work.

562 Professional Issues in Student Affairs Administration 3 Prereq Ed Ad 560, 561. The organization, programs and professional issues related to selected student affairs programs and units.

563 Research in College Student Development 3 Prereq Ed Ad 561. Critique, understand, and apply college social identity models as they relate to teaching, advising, and working with diverse student populations.

565 Practicum in Higher Education 3 (0-9) Prereq graduate student with 15 hours of completed course work in education. Selected supervised experiences in general higher education and student affairs settings provide for the investigation/application of theory/methods gained through formal course work.

567 Diversity in Higher Education 3 Prereq graduate standing. Reflection on experience and examination of the theory of practice or organizational leadership in the context of diversity.

568 Finance and Budgeting in Higher Education 3 Prereq undergraduate macro and microeconomics or by permission of instructor; graduate standing. Exposes students to the fundamentals of higher education budgeting and finance.

570 Community and Technical Colleges 3 For teachers and administrators. Development and function of community and technical colleges.

571 College Teaching 3 Concepts, principles, issues, and procedures in college curriculum development, and college teaching.

572 History of Higher Education 3 History, philosophy, objectives, and issues of colleges and universities as social institutions.

573 Issues in Higher Education 3 Selected contemporary issues in higher education.

578 Higher Education Law and Ethics 3 Legal and ethical aspects of higher education with special reference to administrators, faculty, and students in higher education institutions.

579 Administration of Higher Education 3 Organization, administration and leadership of universities, colleges, and community colleges.

580 School Organization and Administration 3 Readings and discussions on the theories and practices of school organization and administration.

581 Politics in Education 3 Prereq graduate standing. Examining the intrapersonal, organizational politics and political dilemma, particularly as they pertain to marginalized groups.

582 Policy Formation and Analysis in Education 3 Political and organizational policy formation processes in educational organizations; policy analysis in education.

583 Community and Communications 3 Social, political, and economic relationships between education and the community; methods of public polling and campaign strategy techniques.

584 Human Resource Management 3 Human relations in education; problems involved and practical solutions considered.

585 Financial Management in Education 3 Economics and financing of education; financial planning, budget development, investment analysis, bonding, cost effectiveness; current trends in educational finance.

587 Seminar in School Administration V 1-6 May be repeated for credit; cumulative maximum 6 hours. Interdisciplinary seminars; related studies; discussions in several areas by specialists.

588 The Law and Education 3 Fundamental legal principles within which public education functions; applicable school codes of Washington and other states; review important court cases.

589 Leadership Development Seminar 3 Improving knowledge and skills in strategic planning, decision making, leadership issues, conflict, motivation, staff development, productivity, and stress.

590 Internship V 3 (0-9) to 6 (0-18) May be repeated for credit; cumulative maximum 12 hours. By interview only. Internship in professional positions.

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EDPSY

502 Theoretical Foundations of Learning and Instruction 3 Historical and contemporary theories of learning and instruction: application of theory in counseling and teaching settings.

509 Educational Measurements: Test Development and Assessment V 2-3 Theory and use of standardized educational measurement instruments; intelligence, aptitude, and achievement tests; measurement of outcomes.

510 Assessment of Learning 3 Prereq graduate standing. Assessment of student learning, school and district evaluation; particularly appropriate for school administrators.

565 Quantitative Research 3 Prereq EdPsy 508; EdRes 563. Same as EdRes 565.

568 Research Methods II 3 Prereq EdPsy 505, 565. Integration and application of research skills in writing proposals, dissertations, papers for publication; interpreting, critiquing, and synthesizing research studies.

571 Advanced Program Evaluation 3 Prereq EdPsy 570. Advanced methods and techniques of program evaluation.

EDRES

563 Principles of Research 3 Prereq CoPsy 501 or EdRes 562 . The centrality of literature review and the understanding of methods used in educational research; practice in designing research questions.

564 Qualitative Research 3 Prereq EdRes 563. Theoretical underpinnings of qualitative research; familiarity with published qualitative research in education; practical research skills.

565 Quantitative Research 3 Prereq EdPsy 508; EdRes/EdPsy 563. Statistical literacy in educational research; parametric and non-parametric methods.

Teaching And Learning

T & L

524 Topics in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

589 Race, Identity and Representation in Education 3 Interdisciplinary research in race, identity and representations in education.

Educational Leadership - Educational Administration

Degree offered: Doctor of Philosophy (Education)

Faculty working with graduate students: 15

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal)

Deadline: Fall: January 10
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Program Description

WSU's Educational Leadership program offers graduate studies at the masters and doctoral levels and administrator certification programs for the superintendent, residency principal, and residency program administrator certificates. The masters (M.A. and Ed.M.) and doctoral (Ed.D. and Ph.D.) degree programs offer specializations in K-12 educational leadership.Program faculty are dedicated to meeting students' needs as current and future K-12 educational leaders and to preparing future professors for work in academia. The program provides a balance and integration of practical experience, theory, and research and aims to prepare educational leaders who function as scholar-practitioners.Educational leadership programs are offered at all of WSU's campuses (Pullman, Spokane, Tri-Cities, and Vancouver). All campuses offer the Educational Leadership masters degrees, certification programs, and access to the statewide doctor of education degree (Ed.D.). One-year residency at the Pullman campus is required for the doctor of philosophy degree (Ph.D.).WSU's Educational Leadership program is one of 70 doctoral-granting programs nationwide selected for membership in the University Council for Educational Administration, a national consortium dedicated to the improvement of educational leadership preparation and practice. WSU's graduate students have the opportunity to participate in UCEA's annual convention and other professional activities.WSU's administrator certification programs are organized around the national ISLLC (Interstate School Leaders Licensure Consortium) standards, which have been adopted as the certification standards for Washington State licensure.. WSU's innovative cohort-based and field-based certification programs for principals and superintendents promote a close professional network. Faculty members for certification programs have extensive experience as school principals and/or central office administrators.

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EDPSY

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505 Research Methods I 3 Research methods; literature review; design, implementation, and interpretation of results.

508 Educational Statistics 3 Prereq EdPsy 505. Introductory course for graduate students in applied statistics for the behavioral sciences.

565 Quantitative Research 3 Prereq EdPsy 508; EdRes 563. Same as EdRes 565.

570 Introduction to Program Evaluation 3 Prereq EdPsy 505. Introduction to strategies and techniques for evaluation of educational and social programs.

Educational Leadership - Educational Administration

Degree offered: Master of Arts in Education

Faculty working with graduate students: 15

Program offered: Pullman, Tri-Cities

Deadline: Fall: January 10
Spring: September 1

Program Description

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None

Post-Graduate Employment Opportunities

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584 **Human Resource Management** 3 Human relations in education; problems involved and practical solutions considered.

585 **Financial Management in Education** 3 Economics and financing of education; financial planning, budget development, investment analysis, bonding, cost effectiveness; current trends in educational finance.

587 **Seminar in School Administration** V 1-6 May be repeated for credit; cumulative maximum 6 hours. Interdisciplinary seminars; related studies; discussions in several areas by specialists.

588 **The Law and Education** 3 Fundamental legal principles within which public education functions; applicable school codes of Washington and other states; review important court cases.

589 **Leadership Development Seminar** 3 Improving knowledge and skills in strategic planning, decision making, leadership issues, conflict, motivation, staff development, productivity, and stress.

590 **Internship** V 3 (0-9) to 6 (0-18) May be repeated for credit; cumulative maximum 12 hours. By interview only. Internship in professional positions.

596 **Preparing Grant Proposals** 3 Identification of funding sources; analysis, evaluation, and production of grant proposals.

600 **Special Projects or Independent Study** V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 **Master's Research, Thesis, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

EDPSY

502 **Theoretical Foundations of Learning and Instruction** 3 Historical and contemporary theories of learning and instruction: application of theory in counseling and teaching settings.

505 **Research Methods I** 3 Research methods; literature review; design, implementation, and interpretation of results.

508 **Educational Statistics** 3 Prereq EdPsy 505. Introductory course for graduate students in applied statistics for the behavioral sciences.

565 **Quantitative Research** 3 Prereq EdPsy 508; EdRes 563. Same as EdRes 565.

570 **Introduction to Program Evaluation** 3 Prereq EdPsy 505. Introduction to strategies and techniques for evaluation of educational and social programs.

Educational Leadership - Educational Administration

Degree offered: Master of Arts in Education - Non Thesis

Faculty working with graduate students: 15

Program offered: Pullman, Tri-Cities

Deadline: Fall: January 10
Spring: September 1

Program Description

WSU's Educational Leadership program offers graduate studies at the masters and doctoral levels and administrator certification programs for the superintendent, residency principal, and residency program administrator certificates. The masters (M.A. and Ed.M.) and doctoral (Ed.D. and Ph.D.) degree programs offer specializations in K-12 educational leadership.Program faculty are dedicated to meeting students' needs as current and future K-12 educational leaders and to preparing future professors for work in academia. The program provides a balance and integration of practical experience, theory, and research and aims to prepare educational leaders who function as scholar-practitioners.Educational leadership programs are offered at all of WSU's campuses (Pullman, Spokane, Tri-Cities, and Vancouver). All campuses offer the Educational Leadership masters degrees, certification programs, and access to the statewide doctor of education degree (Ed.D.). One-year residency at the Pullman campus is required for the doctor of philosophy degree (Ph.D.).WSU's Educational Leadership program is one of 70 doctoral-granting programs nationwide selected for membership in the University Council for Educational Administration, a national consortium dedicated to the improvement of educational leadership preparation and practice. WSU's graduate students have the opportunity to participate in UCEA's annual convention and other professional activities.WSU's administrator certification programs are organized around the national ISLLC (Interstate School Leaders Licensure Consortium) standards, which have been adopted as the certification standards for Washington State licensure.. WSU's innovative cohort-based and field-based certification programs for principals and superintendents promote a close professional network. Faculty members for certification programs have extensive experience as school principals and/or central office administrators.

Degree Description

The education administration program offers graduate studies at the master's and doctoral levels, plus administrator certification programs for the superintendent, residency principal, and residency program administrator certificates. The master's (M.A. and Ed.M.) and doctoral (Ed.D. and Ph.D.) degree programs offer a specialization in K-12 educational leadership. Program faculty provide a balance and integration of practical experience, theory, and research and aim to prepare educational leaders who function as scholar-practitioners. All campuses offer the educational leadership master's degrees, certification programs, and access to the state-wide doctor of education degree; one-year residency is required for the doctor of philosophy degree. The University's educational leadership program is one of 70 doctoral-granting programs nationwide selected for membership in the University Council for Educational Administration, a national consortium dedicated to the improvement of educational leadership preparation and practice. The administrator certification programs are organized around the national ISLLC (Interstate School Leaders Licensure Consortium) standards, which have been adopted as the certification standards for Washington State licensure. The goal of these standards and our programs is to prepare educational leaders who can provide effective leadership to promote learning for all children in K-12 schools. Washington State University's innovative field-based principal and superintendent certification programs serve certification candidates in a cohort-based program that promotes a close professional network. 4000 Character Limit.

Training and Professional Development Opportunities

None

Post-Graduate Employment Opportunities

None

Post-Graduate Career Placements

None

Contact Information

Graduate Coordinator
Office of Graduate Studies
Washington State University
Cleveland Hall 252
PO Box 642114
Pullman, WA 99163-2114
Telephone: 509-335-9195
Fax: 509-335-2097
E-mail: gradstudies@wsu.edu

Faculty

Michele Acker-Hocevar, Gail Furman, Gordon Gates, Paul Goldman, James Howard, Kristin Huggins, Joan Kingrey, Chad Lochmiller, Forrest Parkay, Paul Pitre, Dennis Ray, Nancy Sanders, Gay Selby, Gene Sharratt and Danny Talbot.

ED AD

501 **Philosophy of Education** 3 Development of American educational philosophy.

503 **Values and Ethics for Educational Leaders** 3 Study of ethical theories, the moral dilemmas of public schooling, and the skills of ethical reasoning; professional code of ethics.

506 **Social Context of Education** 2 The interpretation of social context issues including historical, legal and cultural factors as these influence policies and practice in education.

507 **Social Foundations of Education** 3 Educational adaptations to the economic and social trends and forces.

510 **Improvement of Instruction** 3 Analysis and evaluation of instructional models with emphasis on information processing; implications for changing teaching style.

514 **Basic Principles of Curriculum Design** V 2-3 The application of theoretical concepts and approaches in the planning and design of curricula.

515 **Curriculum Implementation** 3 Research and practice; innovation and change in curricular organization emphasizing implementation.

516 **Instructional and Curricular Leadership** V 2-3 Theory, research, and practice of providing instructional and curricular leadership in schools and other educational settings.

518 **Media Literacy and Educational Technology** 3 Relates research and theory of media literacy to instructional resources and current leadership practices; problems of planning and administering programs.

520 **Seminar in Curriculum and Instruction** V 2-3 Contemporary issues, analyses and developments of educational programs.

521 **Topics in Education** V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and/or applications in selected areas of education.

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531 **Special Topics** 1 May be repeated for credit; cumulative maximum 3 hours. Topical issues in education responding to shifting demands and skills needed by parents, teachers, school administrators and community leaders.

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536 **Introduction to Qualitative Research in Education** 3 Prereq EdPsy 505. Introduction to the theory and methods of qualitative research; field relations, data collections, data analysis, hypothesis development, and theory generation.

537 **Advanced Qualitative Research in Education** 3 Prereq EdRes 564. Advanced theory and methods of qualitative research; theoretical foundations, data collection and analysis, and reporting.

538 **Special Topics in Qualitative Research in Education** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq Ed Ad 536. May be repeated for credit; cumulative maximum 6 hours.

560 **Student Personnel Services in Higher Education** 2 or 3 Philosophy, structure, functions, and organization of student affairs administration.

561 **Introduction to College Student Development** 3 Student development theory, related research and the application of theory to practice in student affairs work.

562 **Professional Issues in Student Affairs Administration** 3 Prereq Ed Ad 560, 561. The organization, programs and professional issues related to selected student affairs programs and units.

563 **Research in College Student Development** 3 Prereq Ed Ad 561. Critique, understand, and apply college social identity models as they relate to teaching, advising, and working with diverse student populations.

565 **Practicum in Higher Education** 3 (0-9) Prereq graduate student with 15 hours of completed course work in education. Selected supervised experiences in general higher education and student affairs settings provide for the investigation/application of theory/methods gained through formal course work.

567 **Diversity in Higher Education** 3 Prereq graduate standing. Reflection on experience and examination of the theory of practice or organizational leadership in the context of diversity.

568 **Finance and Budgeting in Higher Education** 3 Prereq undergraduate macro and microeconomics or by permission of instructor; graduate standing. Exposes students to the fundamentals of higher education budgeting and finance.

570 **Community and Technical Colleges** 3 For teachers and administrators. Development and function of community and technical colleges.

571 **College Teaching** 3 Concepts, principles, issues, and procedures in college curriculum development, and college teaching.

572 **History of Higher Education** 3 History, philosophy, objectives, and issues of colleges and universities as social institutions.

573 **Issues in Higher Education** 3 Selected contemporary issues in higher education.

578 **Higher Education Law and Ethics** 3 Legal and ethical aspects of higher education with special reference to administrators, faculty, and students in higher education institutions.

579 **Administration of Higher Education** 3 Organization, administration and leadership of universities, colleges, and community colleges.

580 **School Organization and Administration** 3 Readings and discussions on the theories and practices of school organization and administration.

581 **Politics in Education** 3 Prereq graduate standing. Examining the intrapersonal, organizational politics and political dilemma, particularly as they pertain to marginalized groups.

582 **Policy Formation and Analysis in Education** 3 Political and organizational policy formation processes in educational organizations; policy analysis in education.

583 **Community and Communications** 3 Social, political, and economic relationships between education and the community; methods of public polling and campaign strategy techniques.

584 **Human Resource Management** 3 Human relations in education; problems involved and practical solutions considered.

585 **Financial Management in Education** 3 Economics and financing of education; financial planning, budget development, investment analysis, bonding, cost effectiveness; current trends in educational finance.

587 **Seminar in School Administration** V 1-6 May be repeated for credit; cumulative maximum 6 hours. Interdisciplinary seminars; related studies; discussions in several areas by specialists.

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EDPSY

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Educational Leadership - Educational Administration

Degree offered: Master of Education

Faculty working with graduate students: 15

Program offered: Pullman, Tri-Cities, Vancouver

Deadline: Fall: January 10
Spring: September 1

Program Description

WSU's Educational Leadership program offers graduate studies at the masters and doctoral levels and administrator certification programs for the superintendent, residency principal, and residency program administrator certificates. The masters (M.A. and Ed.M.) and doctoral (Ed.D. and Ph.D.) degree programs offer specializations in K-12 educational leadership.Program faculty are dedicated to meeting students' needs as current and future K-12 educational leaders and to preparing future professors for work in academia. The program provides a balance and integration of practical experience, theory, and research and aims to prepare educational leaders who function as scholar-practitioners.Educational leadership programs are offered at all of WSU's campuses (Pullman, Spokane, Tri-Cities, and Vancouver). All campuses offer the Educational Leadership masters degrees, certification programs, and access to the statewide doctor of education degree (Ed.D.). One-year residency at the Pullman campus is required for the doctor of philosophy degree (Ph.D.).WSU's Educational Leadership program is one of 70 doctoral-granting programs nationwide selected for membership in the University Council for Educational Administration, a national consortium dedicated to the improvement of educational leadership preparation and practice. WSU's graduate students have the opportunity to participate in UCEA's annual convention and other professional activities.WSU's administrator certification programs are organized around the national ISLLC (Interstate School Leaders Licensure Consortium) standards, which have been adopted as the certification standards for Washington State licensure.. WSU's innovative cohort-based and field-based certification programs for principals and superintendents promote a close professional network. Faculty members for certification programs have extensive experience as school principals and/or central office administrators.

Degree Description

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Training and Professional Development Opportunities

None

Post-Graduate Employment Opportunities

None

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None

Contact Information

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570 Introduction to Program Evaluation 3 Prereq EdPsy 505. Introduction to strategies and techniques for evaluation of educational and social programs.

Educational Leadership

Degree offered: Doctor of Education

Faculty working with graduate students: 13

Graduate students: 82

Program offered: Pullman, Spokane, Tri-Cities, Vancouver

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal)

Deadline: Fall: January 10
Spring: July 1

Requirements

Courses are sequenced to allow students at all campuses to complete program requirements within a four-year time frame (contingent upon successful completion of dissertation research). In addition to program offerings at the regional campuses, students attend two-week summer institutes at the Pullman campus for two consecutive summers, after completion of at least 12 graded credit hours including a research methods course (typically EdRes 563). The purpose of the summer institutes is to build a learning community and support network among the statewide cohort, and to form inquiry groups that will focus dissertation research on common problems of leadership for school improvement. During the third or fourth year of the program, students fulfill the program's residency requirements by enrolling full-time (10-18 credits) in dissertation research (EdAd 800).

Program Description

WSU's Educational Leadership program offers graduate studies at the masters and doctoral levels and administrator certification programs for the superintendent, residency principal, and residency program administrator certificates. The masters (M.A. and Ed.M.) and doctoral (Ed.D. and Ph.D.) degree programs offer specializations in K-12 educational leadership.Program faculty are dedicated to meeting students' needs as current and future K-12 educational leaders and to preparing future professors for work in academia. The program provides a balance and integration of practical experience, theory, and research and aims to prepare educational leaders who function as scholar-practitioners.Educational leadership programs are offered at all of WSU's campuses (Pullman, Spokane, Tri-Cities, and Vancouver). All campuses offer the Educational Leadership masters degrees, certification programs, and access to the statewide doctor of education degree (Ed.D.). One-year residency at the Pullman campus is required for the doctor of philosophy degree (Ph.D.).WSU's Educational Leadership program is one of 70 doctoral-granting programs nationwide selected for membership in the University Council for Educational Administration, a national consortium dedicated to the improvement of educational leadership preparation and practice. WSU's graduate students have the opportunity to participate in UCEA's annual convention and other professional activities.WSU's administrator certification programs are organized around the national ISLLC (Interstate School Leaders Licensure Consortium) standards, which have been adopted as the certification standards for Washington State licensure.. WSU's innovative cohort-based and field-based certification programs for principals and superintendents promote a close professional network. Faculty members for certification programs have extensive experience as school principals and/or central office administrators.

Degree Description

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Post-Graduate Employment Opportunities

K-12 district leadership positions, leadership in public administration or non-profit agencies

Post-Graduate Career Placements

K-12 superintendent, K-12 school district administrator

Contact Information

Graduate Coordinator
Washington State University
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Celeveland Hall 252
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Faculty

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537 Advanced Qualitative Research in Education 3 Prereq EdRes 564. Advanced theory and methods of qualitative research; theoretical foundations, data collection and analysis, and reporting.

538 Special Topics in Qualitative Research in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq Ed Ad 536. May be repeated for credit; cumulative maximum 6 hours.

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589 Leadership Development Seminar 3 Improving knowledge and skills in strategic planning, decision making, leadership issues, conflict, motivation, staff development, productivity, and stress.

590 Internship V 3 (0-9) to 6 (0-18) May be repeated for credit; cumulative maximum 12 hours. By interview only. Internship in professional positions.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

EDPSY

502 Theoretical Foundations of Learning and Instruction 3 Historical and contemporary theories of learning and instruction: application of theory in counseling and teaching settings.

509 Educational Measurements: Test Development and Assessment V 2-3 Theory and use of standardized educational measurement instruments; intelligence, aptitude, and achievement tests; measurement of outcomes.

510 Assessment of Learning 3 Prereq graduate standing. Assessment of student learning, school and district evaluation; particularly appropriate for school administrators.

565 Quantitative Research 3 Prereq EdPsy 508; EdRes 563. Same as EdRes 565.

568 Research Methods II 3 Prereq EdPsy 505, 565. Integration and application of research skills in writing proposals, dissertations, papers for publication; interpreting, critiquing, and synthesizing research studies.

571 Advanced Program Evaluation 3 Prereq EdPsy 570. Advanced methods and techniques of program evaluation.

EDRES

563 **Principles of Research** 3 Prereq CoPsy 501 or EdRes 562 . The centrality of literature review and the understanding of methods used in educational research; practice in designing research questions.

564 **Qualitative Research** 3 Prereq EdRes 563. Theoretical underpinnings of qualitative research; familiarity with published qualitative research in education; practical research skills.

565 **Quantitative Research** 3 Prereq EdPsy 508; EdRes/EdPsy 563. Statistical literacy in educational research; parametric and non-parametric methods.

Teaching And Learning

T & L

524 **Topics in Education** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

589 **Race, Identity and Representation in Education** 3 Interdisciplinary research in race, identity and representations in education.

Educational Leadership

Degree offered: Doctor of Philosophy (Education)

Faculty working with graduate students: 14

Graduate students: 4

Program offered: Pullman, Spokane

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal)

Deadline: Fall: January 10
Spring: September 1

Requirements

A Ph.D. candidate must be enrolled full-time (10-18 credits) for one academic year (consecutive fall and spring semesters) to satisfy WSU's residency requirements for the Doctor of Philosophy degree. The student should consult with his or her committee chair in regard to fulfilling residency requirements.

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WSU's Educational Leadership program offers graduate studies at the masters and doctoral levels and administrator certification programs for the superintendent, residency principal, and residency program administrator certificates. The masters (M.A. and Ed.M.) and doctoral (Ed.D. and Ph.D.) degree programs offer specializations in K-12 educational leadership.Program faculty are dedicated to meeting students' needs as current and future K-12 educational leaders and to preparing future professors for work in academia. The program provides a balance and integration of practical experience, theory, and research and aims to prepare educational leaders who function as scholar-practitioners.Educational leadership programs are offered at all of WSU's campuses (Pullman, Spokane, Tri-Cities, and Vancouver). All campuses offer the Educational Leadership masters degrees, certification programs, and access to the statewide doctor of education degree (Ed.D.). One-year residency at the Pullman campus is required for the doctor of philosophy degree (Ph.D.).WSU's Educational Leadership program is one of 70 doctoral-granting programs nationwide selected for membership in the University Council for Educational Administration, a national consortium dedicated to the improvement of educational leadership preparation and practice. WSU's graduate students have the opportunity to participate in UCEA's annual convention and other professional activities.WSU's administrator certification programs are organized around the national ISLLC (Interstate School Leaders Licensure Consortium) standards, which have been adopted as the certification standards for Washington State licensure.. WSU's innovative cohort-based and field-based certification programs for principals and superintendents promote a close professional network. Faculty members for certification programs have extensive experience as school principals and/or central office administrators.

Degree Description

The educational leadership program offers graduate studies at the master's and doctoral levels, plus administrator certification programs for the superintendent, residency principal, and residency program administrator certificates. The program offers a specialization in K-12 educational leadership. Program faculty provide a balance and integration of practical experience, theory, and research and aim to prepare educational leaders who function as scholar-practitioners. All campuses offer the educational leadership master's degrees, certification programs, and access to the state-wide doctor of education degree; one-year residency is required for the doctor of philosophy degree. The University's educational leadership program is one of 70 doctoral-granting programs nationwide selected for membership in the University Council for Educational Administration, a national consortium dedicated to the improvement of educational leadership preparation and practice. The administrator certification programs are organized around the national ISLLC (Interstate School Leaders Licensure Consortium) standards, which have been adopted as the certification standards for Washington State licensure. The goal of these standards and our programs is to prepare educational leaders who can provide effective leadership to promote learning for all children in K-12 schools. Washington State University's innovative field-based principal and superintendent certification programs serve certification candidates in a cohort-based program that promotes a close professional network.

Post-Graduate Employment Opportunities

University research faculty.

Post-Graduate Career Placements

University research faculty, community college dean

Contact Information

Graduate Coordinator
Washington State University
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Cleveland Hall 252
PO Box 642114
Pullman, WA 99164-2114
Telephone: 509-335-9195
Fax: 509-335-2097
E-mail: gradstudies@wsu.edu

Faculty

Michele Acker-Hocevar, Gail Furman, Gordon Gates, Paul Goldman, James Howard, Kristin Huggins, Joan Kingrey, Chad Lochmiller, Forrest Parkay, Paul Pitre, Nancy Sanders, Gay Selby, Gene Sharratt and Danny Talbot.

ED AD

501 **Philosophy of Education** 3 Development of American educational philosophy.

503 **Values and Ethics for Educational Leaders** 3 Study of ethical theories, the moral dilemmas of public schooling, and the skills of ethical reasoning; professional code of ethics.

506 **Social Context of Education** 2 The interpretation of social context issues including historical, legal and cultural factors as these influence policies and practice in education.

507 **Social Foundations of Education** 3 Educational adaptations to the economic and social trends and forces.

510 **Improvement of Instruction** 3 Analysis and evaluation of instructional models with emphasis on information processing; implications for changing teaching style.

514 **Basic Principles of Curriculum Design** V 2-3 The application of theoretical concepts and approaches in the planning and design of curricula.

515 Curriculum Implementation 3 Research and practice; innovation and change in curricular organization emphasizing implementation.

516 Instructional and Curricular Leadership V 2-3 Theory, research, and practice of providing instructional and curricular leadership in schools and other educational settings.

518 Media Literacy and Educational Technology 3 Relates research and theory of media literacy to instructional resources and current leadership practices; problems of planning and administering programs.

520 Seminar in Curriculum and Instruction V 2-3 Contemporary issues, analyses and developments of educational programs.

521 Topics in Education V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and/or applications in selected areas of education.

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536 Introduction to Qualitative Research in Education 3 Prereq EdPsy 505. Introduction to the theory and methods of qualitative research; field relations, data collections, data analysis, hypothesis development, and theory generation.

537 Advanced Qualitative Research in Education 3 Prereq EdRes 564. Advanced theory and methods of qualitative research; theoretical foundations, data collection and analysis, and reporting.

538 Special Topics in Qualitative Research in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq Ed Ad 536. May be repeated for credit; cumulative maximum 6 hours.

560 Student Personnel Services in Higher Education 2 or 3 Philosophy, structure, functions, and organization of student affairs administration.

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563 Research in College Student Development 3 Prereq Ed Ad 561. Critique, understand, and apply college social identity models as they relate to teaching, advising, and working with diverse student populations.

565 Practicum in Higher Education 3 (0-9) Prereq graduate student with 15 hours of completed course work in education. Selected supervised experiences in general higher education and student affairs settings provide for the investigation/application of theory/methods gained through formal course work.

567 Diversity in Higher Education 3 Prereq graduate standing. Reflection on experience and examination of the theory of practice or organizational leadership in the context of diversity.

568 Finance and Budgeting in Higher Education 3 Prereq undergraduate macro and microeconomics or by permission of instructor; graduate standing. Exposes students to the fundamentals of higher education budgeting and finance.

570 Community and Technical Colleges 3 For teachers and administrators. Development and function of community and technical colleges.

571 College Teaching 3 Concepts, principles, issues, and procedures in college curriculum development, and college teaching.

572 History of Higher Education 3 History, philosophy, objectives, and issues of colleges and universities as social institutions.

573 Issues in Higher Education 3 Selected contemporary issues in higher education.

578 Higher Education Law and Ethics 3 Legal and ethical aspects of higher education with special reference to administrators, faculty, and students in higher education institutions.

579 Administration of Higher Education 3 Organization, administration and leadership of universities, colleges, and community colleges.

580 School Organization and Administration 3 Readings and discussions on the theories and practices of school organization and administration.

581 Politics in Education 3 Prereq graduate standing. Examining the intrapersonal, organizational politics and political dilemma, particularly as they pertain to marginalized groups.

582 Policy Formation and Analysis in Education 3 Political and organizational policy formation processes in educational organizations; policy analysis in education.

583 Community and Communications 3 Social, political, and economic relationships between education and the community; methods of public polling and campaign strategy techniques.

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585 Financial Management in Education 3 Economics and financing of education; financial planning, budget development, investment analysis, bonding, cost effectiveness; current trends in educational finance.

587 Seminar in School Administration V 1-6 May be repeated for credit; cumulative maximum 6 hours. Interdisciplinary seminars; related studies; discussions in several areas by specialists.

588 The Law and Education 3 Fundamental legal principles within which public education functions; applicable school codes of Washington and other states; review important court cases.

589 Leadership Development Seminar 3 Improving knowledge and skills in strategic planning, decision making, leadership issues, conflict, motivation, staff development, productivity, and stress.

590 Internship V 3 (0-9) to 6 (0-18) May be repeated for credit; cumulative maximum 12 hours. By interview only. Internship in professional positions.

596 Preparing Grant Proposals 3 Identification of funding sources; analysis, evaluation, and production of grant proposals.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

EDPSY

510 Assessment of Learning 3 Prereq graduate standing. Assessment of student learning, school and district evaluation; particularly appropriate for school administrators.

EDRES

562 Epistemology, Inquiry, and Representation 3 Prereq doctoral standing; EdPsy 505 or c//. Epistemological assumptions and methodological strategies of research.

563 Principles of Research 3 Prereq CoPsy 501 or EdRes 562 . The centrality of literature review and the understanding of methods used in educational research; practice in designing research questions.

564 Qualitative Research 3 Prereq EdRes 563. Theoretical underpinnings of qualitative research; familiarity with published qualitative research in education; practical research skills.

565 Quantitative Research 3 Prereq EdPsy 508; EdRes/EdPsy 563. Statistical literacy in educational research; parametric and non-parametric methods.

566 Research Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Prereq doctoral student. Presentation and analysis of research; professional development in research presentation.

Educational Leadership

Degree offered: Master of Education

Faculty working with graduate students: 14

Graduate students: 62

Program offered: Pullman, Spokane, Tri-Cities, Vancouver

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal)

Deadline: Fall: January 10
Spring: September 1

Requirements

The Program of Study for the Ed.M. requires a minimum of 35 semester hours, including at least 33hours of graded coursework and 2 hours of EdAd 702 for completion of a master's comprehensiveexamination. At least 21 hours of the graded coursework must be in the Educational Leadership program EdAd course prefix).

Program Description

WSU's Educational Leadership program offers graduate studies at the masters and doctoral levels and administrator certification programs for the superintendent, residency principal, and residency program administrator certificates. The masters (M.A. and Ed.M.) and doctoral (Ed.D. and Ph.D.) degree programs offer specializations in K-12 educational leadership.Program faculty are dedicated to meeting students' needs as current and future K-12 educational leaders and to preparing future professors for work in academia. The program provides a balance and integration of practical experience, theory, and research and aims to prepare educational leaders who function as scholar-practitioners.Educational leadership programs are offered at all of WSU's campuses (Pullman, Spokane, Tri-Cities, and Vancouver). All campuses offer the Educational Leadership masters degrees, certification programs, and access to the statewide doctor of education degree (Ed.D.). One-year residency at the Pullman campus is required for the doctor of philosophy degree (Ph.D.).WSU's Educational Leadership program is one of 70 doctoral-granting programs nationwide selected for membership in the University Council for Educational Administration, a national consortium dedicated to the improvement of educational leadership preparation and practice. WSU's graduate students have the opportunity to participate in UCEA's annual convention and other professional activities.WSU's administrator certification programs are organized around the national ISLLC (Interstate School Leaders Licensure Consortium) standards, which have been adopted as the certification standards for Washington State licensure.. WSU's innovative cohort-based and field-based certification programs for principals and superintendents promote a close professional network. Faculty members for certification programs have extensive experience as school principals and/or central office administrators.

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Post-Graduate Employment Opportunities

K-12 administrator, preparation for advanced graduate study, administration in public or non-profit agency

Post-Graduate Career Placements

K-12 school district program administrator, principal, and teacher

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600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

EDPSY

502 Theoretical Foundations of Learning and Instruction 3 Historical and contemporary theories of learning and instruction: application of theory in counseling and teaching settings.

505 Research Methods I 3 Research methods; literature review; design, implementation, and interpretation of results.

508 Educational Statistics 3 Prereq EdPsy 505. Introductory course for graduate students in applied statistics for the behavioral sciences.

570 Introduction to Program Evaluation 3 Prereq EdPsy 505. Introduction to strategies and techniques for evaluation of educational and social programs.

Educational Psychology

Degree offered: Doctor of Philosophy (Education)

Faculty working with graduate students: 6

Graduate students: 9

Graduate students receiving assistantships or scholarships: 100%

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal)

Deadline: Fall: January 10
Spring: January 10

Program Description

Graduates in educational psychology can expect to earn a good salary and maintain an interesting and fulfilling career. Individuals with strong research and evaluation skills in education and/or the social sciences are highly sought after for jobs in industry, state agencies, laboratories, school districts, and universities.The core requirements in Research, Evaluation, and Measurement (REM) provide students with a solid academic foundation. In addition, all degree programs afford some flexibility to tailor course work to individual student preferences and research options.Successful professionals in this field have strong methodological skills, an understanding of researchable topics, the ability to develop a research program, the ability to communicate and work with a wide variety of professionals, and the skills to understand nuance and ambiguity in the work environment. Thus, we seek individuals who will first meet challenging academic standards for entrance and show promise for success in the exciting field of educational research and evaluation.The educational psychology program is committed to the creation and study of environments that enhance learning potential and promote lifelong learning for people of all ages, abilities, and backgrounds. Through faculty and student partnerships across campus, the program provides an exciting, interdisciplinary atmosphere for course and field study.Consistent with the scientist-practitioner model of professional training in psychology, students in the doctoral program in educational psychology are required to integrate the theoretical and research offerings of the university with substantial practicum and internship experiences by completing an internship directly related to the specific area of professional training.

Degree Description

The educational psychology program, with core requirements in research, evaluation, and measurement and learning theory, provides students with a solid academic foundation in educational measurement and evaluation. In 2009 , the College of Education Learning and Performance Research Center (formally the Assessment and Evaluation Center) was established at WSU to provide leadership, training, consultation, and state-the-art solutions to challenging educational research questions at the university, state, national, and international levels.. Assistantships for educational psychology students in the center provide unique opportunities to apply theoretical concepts and methodologies of program evaluation and educational and psychological measurement to specific practical projects in various educational settings through partnerships with school districts, state agencies, and other social service organizations. Successful professionals in this field have strong methodological skills, an understanding of researchable topics, the ability to develop a research program, the ability to communicate and work with a wide variety of professionals, and the skills to understand nuance and ambiguity in the work environment. Through faculty and student partnerships across campus, the program provides an exciting, interdisciplinary atmosphere for course and field study. Consistent with the scientist-practitioner model of professional training in psychology, students in the doctoral program in educational psychology are required to integrate the theoretical and research offerings of the university with substantial practicum and internship experiences by completing an internship directly related to the specific area of professional training.

Post-Graduate Employment Opportunities

Research, evaluation, and measurement positions at school districts, state education agencies, and universities; positions in the testing industry; researcher at national firms studying educational issues; assessment specialist at national foundation.

Post-Graduate Career Placements

Evaluator for Appalachian Education Laboratory, West Virginia; assessment specialist for the regional educational agency in Cedar Rapids, Iowa; assistant professor in measurement, statistics, and evaluation, Indiana State University; research scientist, Duke Energies, South Carolina; assistant professor of Educational Technology, Morehead State University, Minnesota; Project Director of Psychometrics, Applied Measurement Professionals.

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Faculty

Olusola Adesope, Jennifer Beller, Austin Church, Brian French, Gail Furman and Michael Trevisan.

COPSY

542 Cross-cultural Research in Counseling and Assessment 3 Cross-cultural research methods, concepts, and findings in counseling and assessment.

ED AD

521 Topics in Education V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and/or applications in selected areas of education.

537 Advanced Qualitative Research in Education 3 Prereq EdRes 564. Advanced theory and methods of qualitative research; theoretical foundations, data collection and analysis, and reporting.

538 Special Topics in Qualitative Research in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq Ed Ad 536. May be repeated for credit; cumulative maximum 6 hours.

EDPSY

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503 Advanced Educational Psychology 2 Theories of learning and development as applied to education.

505 Research Methods I 3 Research methods; literature review; design, implementation, and interpretation of results.

508 Educational Statistics 3 Prereq EdPsy 505. Introductory course for graduate students in applied statistics for the behavioral sciences.

509 Educational Measurements: Test Development and Assessment V 2-3 Theory and use of standardized educational measurement instruments; intelligence, aptitude, and achievement tests; measurement of outcomes.

511 Large Scale Educational Assessment and Testing 3 Prereq EdPsy 508; 509. Large-scale educational assessment and test development and evaluation; history and policy uses of achievement tests.

521 Topics in Educational Psychology V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and/or applications in selected areas of educational psychology.

563 Principles of Research 3 Prereq EdRes 562 or CoPsy 501. Same as EdRes 563.

564 Qualitative Research 3 Prereq EdRes 563. Same as EdRes 564.

565 Quantitative Research 3 Prereq EdPsy 508; EdRes 563. Same as EdRes 565.

568 Research Methods II 3 Prereq EdPsy 505, 565. Integration and application of research skills in writing proposals, dissertations, papers for publication; interpreting, critiquing, and synthesizing research studies.

569 Seminar in Quantitative Techniques in Education 2 or 3 May be repeated for credit; cumulative maximum 6 hours. Prereq EdPsy 565. Application of parametric and nonparametric statistics, data processing using computer packages in educational research.

570 Introduction to Program Evaluation 3 Prereq EdPsy 505. Introduction to strategies and techniques for evaluation of educational and social programs.

571 Advanced Program Evaluation 3 Prereq EdPsy 570. Advanced methods and techniques of program evaluation.

597 Educational Psychology Internship V 2 (0-6) to 4 (0-12) May be repeated for credit; cumulative maximum 8 hours. Supervised internship experience in educational psychology, measurement and evaluation.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

EDRES

562 Epistemology, Inquiry, and Representation 3 Prereq doctoral standing; EdPsy 505 or c//. Epistemological assumptions and methodological strategies of research.

566 Research Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Prereq doctoral student. Presentation and analysis of research; professional development in research presentation.

SOC

520 Research Methods in Sociology 3 Methodology of social research at the professional level.

525 Practicum in Survey Research 3 Prereq Soc 520. Practical experience in design and implementation of telephone and mail surveys; participation in all aspects of conducting a survey.

Educational Psychology

Degree offered: Master of Arts in Education

Faculty working with graduate students: 6

Graduate students: 3

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EDPSY

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503 Advanced Educational Psychology 2 Theories of learning and development as applied to education.

504 Classroom-focused Research Methods 2 Methods, design, implementation, and application of results in classroom context.

505 Research Methods I 3 Research methods; literature review; design, implementation, and interpretation of results.

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597 Educational Psychology Internship V 2 (0-6) to 4 (0-12) May be repeated for credit; cumulative maximum 8 hours. Supervised internship experience in educational psychology, measurement and evaluation.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Educational Psychology

Degree offered: Master of Arts in Education - Non Thesis

Faculty working with graduate students: 6

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal)

Deadline: Fall: January 10
Spring: September 1

Requirements

None

Program Description

Graduates in educational psychology can expect to earn a good salary and maintain an interesting and fulfilling career. Individuals with strong research and evaluation skills in education and/or the social sciences are highly sought after for jobs in industry, state agencies, laboratories, school districts, and universities.The core requirements in Research, Evaluation, and Measurement (REM) provide students with a solid academic foundation. In addition, all degree programs afford some flexibility to tailor course work to individual student preferences and research options.Successful professionals in this field have strong methodological skills, an understanding of researchable topics, the ability to develop a research program, the ability to communicate and work with a wide variety of professionals, and the skills to understand nuance and ambiguity in the work envi-

ronment. Thus, we seek individuals who will first meet challenging academic standards for entrance and show promise for success in the exciting field of educational research and evaluation.The educational psychology program is committed to the creation and study of environments that enhance learning potential and promote lifelong learning for people of all ages, abilities, and backgrounds. Through faculty and student partnerships across campus, the program provides an exciting, interdisciplinary atmosphere for course and field study.Consistent with the scientist-practitioner model of professional training in psychology, students in the doctoral program in educational psychology are required to integrate the theoretical and research offerings of the university with substantial practicum and internship experiences by completing an internship directly related to the specific area of professional training.

Degree Description

The educational psychology program, with core requirements in research, evaluation, and measurement and learning theory, provides students with a solid academic foundation in educational measurement and evaluation. In 2009 , the College of Education Learning and Performance Research Center (formally the Assessment and Evaluation Center) was established at WSU to provide leadership, training, consultation, and state-the-art solutions to challenging educational research questions at the university, state, national, and international levels.. Assistantships for educational psychology students in the center provide unique opportunities to apply theoretical concepts and methodologies of program evaluation and educational and psychological measurement to specific practical projects in various educational settings through partnerships with school districts, state agencies, and other social service organizations. Successful professionals in this field have strong methodological skills, an understanding of researchable topics, the ability to develop a research program, the ability to communicate and work with a wide variety of professionals, and the skills to understand nuance and ambiguity in the work environment. Through faculty and student partnerships across campus, the program provides an exciting, interdisciplinary atmosphere for course and field study. Consistent with the scientist-practitioner model of professional training in psychology, students in the doctoral program in educational psychology are required to integrate the theoretical and research offerings of the university with substantial practicum and internship experiences by completing an internship directly related to the specific area of professional training.

Post-Graduate Employment Opportunities

Research, evaluation, and measurement positions at school districts, state education agencies, and universities; positions in the testing industry; researcher at national firms studying educational issues; assessment specialist at national foundation

Post-Graduate Career Placements

Evaluator for Appalachian Education Laboratory, West Virginia; assessment specialist for the regional educational agency in Cedar Rapids, Iowa; assistant professor in measurement, statistics, and evaluation, Indiana State University; research scientist, Duke Energies, South Carolina; assistant professor of Educational Technology, Morehead State University, Minnesota; Project Director of Psychometrics, Applied Measurement Professionals

Contact Information

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Telephone: 509-335-9195
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E-mail: gradstudies@wsu.edu

Faculty

Olusola Adesope, Jennifer Beller, Austin Church, Brian French, Gail Furman and Michael Trevisan.

EDPSY

502 **Theoretical Foundations of Learning and Instruction** 3 Historical and contemporary theories of learning and instruction: application of theory in counseling and teaching settings.

503 **Advanced Educational Psychology** 2 Theories of learning and development as applied to education.

504 **Classroom-focused Research Methods** 2 Methods, design, implementation, and application of results in classroom context.

505 **Research Methods I** 3 Research methods; literature review; design, implementation, and interpretation of results.

508 **Educational Statistics** 3 Prereq EdPsy 505. Introductory course for graduate students in applied statistics for the behavioral sciences.

509 **Educational Measurements: Test Development and Assessment** V 2-3 Theory and use of standardized educational measurement instruments; intelligence, aptitude, and achievement tests; measurement of outcomes.

510 **Assessment of Learning** 3 Prereq graduate standing. Assessment of student learning, school and district evaluation; particularly appropriate for school administrators.

511 **Large Scale Educational Assessment and Testing** 3 Prereq EdPsy 508; 509. Large-scale educational assessment and test development and evaluation; history and policy uses of achievement tests.

521 **Topics in Educational Psychology** V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and/or applications in selected areas of educational psychology.

563 **Principles of Research** 3 Prereq EdRes 562 or CoPsy 501. Same as EdRes 563.

564 **Qualitative Research** 3 Prereq EdRes 563. Same as EdRes 564.

565 **Quantitative Research** 3 Prereq EdPsy 508; EdRes 563. Same as EdRes 565.

568 **Research Methods II** 3 Prereq EdPsy 505, 565. Integration and application of research skills in writing proposals, dissertations, papers for publication; interpreting, critiquing, and synthesizing research studies.

569 **Seminar in Quantitative Techniques in Education** 2 or 3 May be repeated for credit; cumulative maximum 6 hours. Prereq EdPsy 565. Application of parametric and nonparametric statistics, data processing using computer packages in educational research.

570 **Introduction to Program Evaluation** 3 Prereq EdPsy 505. Introduction to strategies and techniques for evaluation of educational and social programs.

571 **Advanced Program Evaluation** 3 Prereq EdPsy 570. Advanced methods and techniques of program evaluation.

597 **Educational Psychology Internship** V 2 (0-6) to 4 (0-12) May be repeated for credit; cumulative maximum 8 hours. Supervised internship experience in educational psychology, measurement and evaluation.

600 **Special Projects or Independent Study** V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 **Master's Special Problems, Directed Study, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

Educational Psychology

Degree offered: Master of Education

Faculty working with graduate students: 6

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal)

Deadline: Fall: January 10
Spring: July 1

Program Description

Graduates in educational psychology can expect to earn a good salary and maintain an interesting and fulfilling career. Individuals with strong research and evaluation skills in education and/or the social sciences are highly sought after for jobs in industry, state agencies, laboratories, school districts, and universities.The core requirements in Research, Evaluation, and Measurement (REM) provide students with a solid academic foundation. In addition, all degree programs afford some flexibility to tailor course work to individual student preferences and research options.Successful professionals in this field have strong methodological skills, an understanding of researchable topics, the ability to develop a research program, the ability to communicate and work with a wide variety of professionals, and the skills to understand nuance and ambiguity in the work environment. Thus, we seek individuals who will first meet challenging academic standards for entrance and show promise for success in the exciting field of educational research and evaluation.The educational psychology program is committed to the creation and study of environments that enhance learning potential and promote lifelong learning for people of all ages, abilities, and backgrounds. Through faculty and student partnerships across campus, the program provides an exciting, interdisciplinary atmosphere for course and field study.Consistent with the scientist-practitioner model of professional training in psychology, students in the doctoral program in educational psychology are required to integrate the theoretical and research offerings of the university with substantial practicum and internship experiences by completing an internship directly related to the specific area of professional training.

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Post-Graduate Employment Opportunities

Research, evaluation, and measurement positions at school districts, state education agencies, and universities; positions in the testing industry; researcher at national firms studying educational issues; assessment specialist at national foundation

Post-Graduate Career Placements

Evaluator for Appalachian Education Laboratory, West Virginia; assessment specialist for the regional educational agency in Cedar Rapids, Iowa; assistant professor in measurement, statistics, and evaluation, Indiana State University; research scientist, Duke Energies, South Carolina; assistant professor of Educational Technology, Morehead State University, Minnesota; Project Director of Psychometrics, Applied Measurement Professionals.

Contact Information

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E-mail: gradstudies@wsu.edu

Faculty

Olusola Adesope, Jennifer Beller, Austin Church, Brian French, Gail Furman and Michael Trevisan.

EDPSY

502 Theoretical Foundations of Learning and Instruction 3 Historical and contemporary theories of learning and instruction: application of theory in counseling and teaching settings.

503 Advanced Educational Psychology 2 Theories of learning and development as applied to education.

504 Classroom-focused Research Methods 2 Methods, design, implementation, and application of results in classroom context.

505 Research Methods I 3 Research methods; literature review; design, implementation, and interpretation of results.

508 Educational Statistics 3 Prereq EdPsy 505. Introductory course for graduate students in applied statistics for the behavioral sciences.

509 Educational Measurements: Test Development and Assessment V 2-3 Theory and use of standardized educational measurement instruments; intelligence, aptitude, and achievement tests; measurement of outcomes.

510 Assessment of Learning 3 Prereq graduate standing. Assessment of student learning, school and district evaluation; particularly appropriate for school administrators.

511 Large Scale Educational Assessment and Testing 3 Prereq EdPsy 508; 509. Large-scale educational assessment and test development and evaluation; history and policy uses of achievement tests.

521 Topics in Educational Psychology V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and/or applications in selected areas of educational psychology.

563 Principles of Research 3 Prereq EdRes 562 or CoPsy 501. Same as EdRes 563.

564 Qualitative Research 3 Prereq EdRes 563. Same as EdRes 564.

565 Quantitative Research 3 Prereq EdPsy 508; EdRes 563. Same as EdRes 565.

568 Research Methods II 3 Prereq EdPsy 505, 565. Integration and application of research skills in writing proposals, dissertations, papers for publication; interpreting, critiquing, and synthesizing research studies.

569 Seminar in Quantitative Techniques in Education 2 or 3 May be repeated for credit; cumulative maximum 6 hours. Prereq EdPsy 565. Application of parametric and nonparametric statistics, data processing using computer packages in educational research.

570 Introduction to Program Evaluation 3 Prereq EdPsy 505. Introduction to strategies and techniques for evaluation of educational and social programs.

571 Advanced Program Evaluation 3 Prereq EdPsy 570. Advanced methods and techniques of program evaluation.

597 Educational Psychology Internship V 2 (0-6) to 4 (0-12) May be repeated for credit; cumulative maximum 8 hours. Supervised internship experience in educational psychology, measurement and evaluation.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Electrical Engineering

Degree offered: Doctor of Philosophy (Electrical and Computer Engineering)

Graduate students: 49

Graduate students receiving assistantships or scholarships: 100%

Tests required: GRE (Combined), TOEFL

Deadline: Fall: January 10th
Spring: July 1st

Requirements

Qualifying Examination in 3rd Semester

Degree Description

Contact Information

Sidra Gleason
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Electrical Engineering

Degree offered: Master of Science in Electrical Engineering

Program offered: Pullman, Spokane, Tri-Cities

Tests required: TOEFL

Deadline: Fall: January 10th
Spring: July 1st

Degree Description

The program must consist of 30 or more hours of credit including 21 or more hours of coursework for which a grade of A-F is given and nine or more credits of thesis research (EE 700).Under the thesis option (all programs), the student is expected to complete a significant research project and submit a thesis, which adheres to EECS standards and the formatting requirements of the advisory committee and the Graduate School. The thesis work should be submitted for refereed publication prior to scheduling the final exam. It is the student's responsibility to meet the deadlines specified by the Graduate School. All students on financial aid from WSU must choose the thesis option.

Engineering

Degree offered: Master of Science in Engineering

Faculty working with graduate students: 5

Graduate students: 7

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Program Description

This is an interdisciplinary program administered through the College of Engineering and Architecture's Office of the Associate Dean of Research and Graduate Programs, with students typically advised and funded through one of several departments in the College. The interdisciplinary nature of this degree provides considerable flexibility in designing programs of study tailored to the specialized needs of each student. Areas of specialization include (but are not limited to): biological systems engineering, atmospheric research, materials science and engineering, and bioengineering. These students often work in one of our interdisciplinary centers such as: Bioengineering Research Center (BRC), Center for Environmental, Sediment, and Aquatic Research (CESAR), Center for Environmental Education and Outreach (CEREO), Center for Materials Research (CMR), Engineering Education Research Center (EERC), Laboratory for Atmospheric Research (LAR), and the Wood Materials Research Lab (WMEL). Thesis and non-theses options are available in the M.S. degree program.

Degree Description

These interdisciplinary programs are administered through the College of Engineering and Architecture's Office of the Associate Dean of Research and Graduate Programs, with students typically advised and funded through one of several departments in the College. The interdisciplinary nature of these degrees provides considerable flexibility in designing programs of study tailored to the specialized needs of each student.Areas of specialization include (but are not limited to): biological systems engineering,atmospheric research,materials science and engineering,and bioengineering. These students often work in one of our interdisciplinary centers such as: Bioengineering Research Center (BRC), Center for Environmental, Sediment, and Aquatic Research (CESAR), Center for Environmental Education and Outreach (CEREO), Center for Materials Research (CMR), Engineering Education Research Center (EERC), Laboratory for Atmospheric Research (LAR), and the Wood Materials Research Lab (WMEL). Thesis and non-theses options are available in the M.S. degree program.

Training and Professional Development Opportunities

None

Post-Graduate Employment Opportunities

None

Post-Graduate Career Placements

None

Contact Information

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Faculty

Shulin Chen, Manuel Garcia-Perez, Claudio Stockle, Anita Vasavada and Joan Wu.

Engineering

Degree offered: Master of Science in Engineering - Non Thesis

Faculty working with graduate students: 4

Graduate students: 4

Graduate students receiving assistantships or scholarships: 25%

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

No additional requirements.

Program Description

This is an interdisciplinary program administered through the College of Engineering and Architecture's Office of the Associate Dean of Research and Graduate Programs, with students typically advised and funded through one of several departments in the College. The interdisciplinary nature of this degree provides considerable flexibility in designing programs of study tailored to the specialized needs of each student. Areas of specialization include (but are not limited to): biological systems engineering, atmospheric research, materials science and engineering, and bioengineering. These students often work in one of our interdisciplinary centers such as: Bioengineering Research Center (BRC),

Center for Environmental, Sediment, and Aquatic Research (CESAR), Center for Environmental Education and Outreach (CEREO), Center for Materials Research (CMR), Engineering Education Research Center (EERC), Laboratory for Atmospheric Research (LAR), and the Wood Materials Research Lab (WMEL). Thesis and non-theses options are available in the M.S. degree program.

Degree Description

This is an interdisciplinary program administered through the College of Engineering and Architecture's Office of the Associate Dean of Research and Graduate Programs, with students typically advised and funded through one of several departments in the College. The interdisciplinary nature of this degree provides considerable flexibility in designing programs of study tailored to the specialized needs of each student. Areas of specialization include (but are not limited to): biological systems engineering, atmospheric research, materials science and engineering, and bioengineering. These students often work in one of our interdisciplinary centers such as: Bioengineering Research Center (BRC), Center for Environmental, Sediment, and Aquatic Research (CESAR), Center for Environmental Education and Outreach (CEREO), Center for Materials Research (CMR), Engineering Education Research Center (EERC), Laboratory for Atmospheric Research (LAR), and the Wood Materials Research Lab (WMEL). Thesis and non-theses options are available in the M.S. degree program

Training and Professional Development Opportunities

None

Post-Graduate Employment Opportunities

None

Post-Graduate Career Placements

None

Contact Information

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Faculty

Shulin Chen, Shyam Sablani, Anita Vasavada and Joan Wu.

Engineering and Technology Management

Degree offered: Master of Engineering and Technology Management

Faculty working with graduate students: 7

Graduate students: 164

Program offered: DDP

Deadline: Fall: July 15 (January 10 international)
Spring: November 1 (July 1 international)
Summer: April 1 (Default international)

Requirements

Students must complete six classes from the core areas of study and four electives to equal 10 classes (30 graded credits); and students must choose either a 2-3 credit comprehensive exam or a 4+ credit project.

Program Description

The Master of Engineering and Technology Management Program (METM) prepares engineering and business professionals to make strategic and operational decisions and become leaders in the management of technology. The program provides technology team managers with the knowledge, tools, and skills to become proficient managers of projects, operations, organizations, and people.Students will learn problem-solving tools, leadership skills, and corporate strategy; as well asTheory of Constraint methods to achieve quick improvements. Students will improve skills in managing variability, controlling uncertainty, overcoming obstacles, and meeting objectives. They will become a better a systems thinker, project manager, and decision maker. The program provides the education necessary to understand finance, organization, and people/project management; to apply optimization, statistics, and strategy to improve results. The program helps the student to learn valuable management tools, such as performance management, Lean and Six Sigma methodologies, and supply chain principles and to learn how to implement effective and lasting changes that will benefit the bottom line.

Degree Description

A Master's Degree in Engineering and Technology Management (METM) requires 30 semester hours (10 courses) of course work and two to four credits of a final non-thesis project report or comprehensive exam (E M 702). The program is interdisciplinary, with course offerings in engineering management and technology related business courses. E M courses are delivered via the Internet to students worldwide. Elluminate Web conferencing software allows faculty and students to interact and collaborate in a virtual classroom environment in real-time. Each class session is a self-contained Webinar presented and facilitated by your instructor. All course webinars are presented and managed using WSU's Angel Learning Management System, a Web-enabled course hosting platform. Students must be familiar with the software used in the METM Program before taking classes. Links are posted on the program web site.

Training and Professional Development Opportunities

Students may choose either one of the many graduate certificates or the full master of engineering and technonolgy mangement degree. Many students earn one or more certificates while working towards the masters degree. Others begin in the certificate program and migrate to a full degree program.

Post-Graduate Employment Opportunities

The Master of Engineering and Technology Management Program (METM) prepares engineering and business professionals to make strategic and operational decisions and become leaders in the management of technology. The program provides technology team managers with the knowledge, tools, and skills to become proficient managers of projects, operations, organizations, and people. The program is specifically tailored for professionals who want to advance their careers while still working fulltime.

Contact Information

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Program Support Supervisor
Engineering and Technology Management
ETRL 336
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E-mail: engrmgt@wsu.edu

Faculty

Robert Crick, William Gray, James Holt, Edward Ladd, John Ringo, Hal Rumsey and George Sudikatus.

Engineering Management

E M

501 Management of Organizations 3 Exploration of issues related to individual behavior in work organizations, including motivation, leadership, team-building, and team management skills.

505 Finance for Technical Systems 3 Time value of money, capital budgeting, accounting principles, cost, valuation, risk, cost accounting and sensitivity analyses: concepts for engineering decision-making.

508 Legal Concepts for Engineering and Technical Managers 3 Prereq graduate standing. Basic legal obligations of engineering/technical managers; identify, minimize and recognize risks and liability; contemporary legal environment and business law.

520 Construction Project Management 3 Prereq graduate standing. Construction project bids, proposals, contracts, project delivery/organization; estimating, scheduling, resource loading, project monitoring and controls, safety and quality

522 Supervision and Leadership for Engineering and Technology Managers 3 Prereq graduate standing. Strategies of supervision with practical application techniques presented to create individual and organizational motivation.

526 Constraints Management 3 Graduate-level counterpart of E M 426; additional requirements. Credit not granted for both E M 426 and 526.

530 Applications of Constraints Management 3 Graduate-level counterpart of E M 430; additional requirements. Credit not granted for both E M 430 and 530.

534 Contemporary Topics in Constraints Management 3 May be repeated for credit; cumulative maximum 6 hours. Prereq E M 526 or 530. Contemporary teaching tools, software packages, current techniques and thought in managing complex systems using the theory of constraints.

538 Lean Agility 3 3 Prereq graduate standing. Integration of the best of Lean, Six Sigma, and Theory of Constraints to accelerate the continuous improvement process.

540 Operations Research for Managers 3 Applying linear, integer, goal programming; network optimization; queuing analysis; dynamic programming; simulation; Markov analysis; and forecasting to engineering management decisions.

545 Technical Decision Analysis 3 Prereq basic stats course; graduate standing. Decision analysis provides a structured discipline for describing, analyzing, and finalizing decisions involving uncertainty.

555 Enterprise Resource Management 3 Prereq graduate standing. Focusing the flow of quality, timely products and cooperative supply chain operations and planning using simulation and effective enterprise resource management.

560 Integrated Supply Chain Management 3 How technical managers analyze and manage the flow of materials, services, and information for products from inception to final customer.

564 Project Management 3 Planning, organizing, scheduling and controlling major projects; human dimensions, PERT and CPM scheduling models, resource allocation, and cost controls. Credit not granted for both E M 464 and 564.

565 Introduction to Systems Management 3 Prereq graduate standing. Design manufacture, operation of complex system development for engineering managers; project planning, organizing, and controlling tools for engineering system constraints.

566 System Engineering Analysis and Practice 3 Prereq graduate standing. Problem-solving methodologies based on system concepts and design applications for complex, large-scale technical systems pertinent to program managers.

570 Six Sigma Quality Management 3 Prereq graduate standing. Graduate-level counterpart of E M 470; additional requirements. Credit not granted for both E M 470 and 570.

575 Performance Management in Technical Organizations 3 Management of high technology organizations; planning, measurement, and human factors in improving high technology organizations; productivity, motivation and performance systems.

580 Quality Control and Reliability 3 Prereq graduate standing; rec Stat 430. Graduate-level counterpart of E M 480; additional requirements. Credit not granted for both E M 480 and 580.

585 Quality Engineering Using Design of Experiments 3 Prereq graduate standing; Rec Stat 430. Graduate-level counterpart of E M 485; additional requirements. Credit not granted for both E M 485 and 585.

590 Design for Product and Service Realization 3 Prereq graduate standing. Same as E M 490; additional requirements. Credit not granted for both E M 490 and 590.

591 Strategic Management of Technology and Innovations in Engineering 3 Prereq graduate standing. Management of technological innovation; integrating strategy, new product development, corporate entrepreneurship, and innovation; features action-oriented cases.

595 Advanced Topics in Engineering Management I V 1-3 May be repeated for credit; cumulative maximum 9 hours. A wide range of current high-interest engineering management topics.

596 Advanced Topics in Engineering Management II 3 May be repeated for credit; cumulative maximum 9 hours. A wide range of current high-interest engineering management topics.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Engineering Management

STAT

430 Statistical Methods in Engineering 3 Prereq Math 172; 220. Random variables, sampling, hypothesis testing; linear, multilinear, and nonlinear regression; analysis of variance for designed experiments; statistical computing. Credit not normally granted for both Math 430 and 442.

Engineering Nanotechnology - Cert in Eng Nanotechnology

Degree offered: Graduate Certificate in Engineering Nanotechnology

Faculty working with graduate students: 30

Graduate students: 5

Program offered: Pullman, Tri-Cities

Deadline: Fall: January 10
Spring: July 1

Requirements

The student must complete a minimum of 9 credits from the following list of 3-credit courses: ME 509 MEMS Engineering, ME 520 Multiscale Modeling, ME 526 Microscopic Thermodynamics, MSE 506 Biomaterials, MSE 517 Thin Films, MSE 592 Transmission Electron Microscopy. Note: courses in which a grade of B- or below is obtained may not count towards completion of the requirements.

Program Description

Nanotechnology is the vanguard of a revolution in technology and industry. Fundamental nanoscale processes, nanomaterials, nanoscale devices and systems, and instrumentation for nanotechnology have been identified as key component areas by the National Nanotechnology Initiative. This certificate program is designed for working professionals who wish to develop expertise in this emerging technology to advance their careers or graduate students who wish to have an emphasis in this area. The program will provide a suite of classes that will offer a focused and comprehensive emphasis in

engineering nanotechnology.

Degree Description

This certificate program is designed for working professionals who wish to develop expertise in this emerging technology to advance their careers or graduate students who wish to have an emphasis in this area. Students must complete a minimum of nine credits from a specific list of three-credit 500-level courses found at http://www.mme.wsu.edu/grad/certificate.html.

Training and Professional Development Opportunities

None.

Post-Graduate Employment Opportunities

This certificate program is designed for working professionals who wish to develop expertise in this emerging technology to advance their careers or graduate students who wish to have an emphasis in this area.

Contact Information

Mary Simonsen
Graduate Academic Coordinator
School of Mechanical & Materials Engineering
Sloan Hall 203E, PO Box 642920
Pullman, WA 99164-2920
Telephone: 509-335-4546
Fax: 509-335-4662
E-mail: gradapp@mme.wsu.edu

Faculty

Gaurav Ameta, Stephen Antolovich, David Bahr, Amit Bandyopadhyay, Susmita Bose, Jow-Lian Ding, Indranath Dutta, Prashanta Dutta, Karl Englund, David Field, Sankar Jayaram, Uma Jayaram, William Kinsel, Jacob Leachman, David Lin, Kelvin Lynn, Konstantin Matveev, Sinisa Mesarovic, Changki Mo, M Norton, Jitesh Panchal, Charles Pezeshki, Cecilia Richards, Robert Richards, Lloyd Smith, Anita Vasavada, Michael Wolcott, Hussein Zbib, Jinwen Zhang and Weihong Zhong.

Mechanical Engineering

M E

509 **MEMS Engineering** 3 (2-3) Prereq graduate standing or permission of instructor. Introduction to the design, fabrication and application of microelectromechanical systems.

520 **Multiscale Modeling in Thermomechanics of Materials** 3 Prereq graduate standing or permission of instructor. Multiscale problems in thermomechanics of materials; practical and computational aspects of homogenization, granular materials, dislocation plasticity and atomistic methods.

Materials Science And Engineering

MSE

506 **Biomaterials** 3 Prereq MSE 201 and permission of instructor. Graduate-level counterpart of MSE 406; additional requirements. Credit not granted for both MSE 406 and 506.

517 **Thin Films** 3 Prereq graduate standing or senior in engineering or science. Materials science aspect of thin films, including growth, characterization, and properties for electrical, mechanical, corrosion, and optical behavior.

592 **Transmission Electron Microscopy** 3 Development of the principles and applications of electron optics in microscopy.

Engineering Science

Degree offered: Doctor of Philosophy (Engineering Science)

Faculty working with graduate students: 27

Graduate students: 39

Graduate students receiving assistantships or scholarships: 89%

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Program Description

These interdisciplinary programs are administered through the College of Engineering and Architecture's Office of the Associate Dean of Research and Graduate Programs, with students typically advised and funded through one of several departments in the College. The interdisciplinary nature of these degrees provides considerable flexibility in designing programs of study tailored to the specialized needs of each student. Areas of specialization include (but are not limited to): biological systems engineering, atmospheric research, materials science and engineering, and bioengineering. These students often work in one of our interdisciplinary centers such as: Bioengineering Research Center (BRC), Center for Environmental, Sediment, and Aquatic Research (CESAR), Center for Environmental Education and Outreach (CEREO), Center for Materials Research (CMR), Engineering Education Research Center (EERC), Laboratory for Atmospheric Research (LAR), and the Wood Materials Research Lab (WMEL).

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Training and Professional Development Opportunities

None

Post-Graduate Employment Opportunities

None

Post-Graduate Career Placements

None

Contact Information

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Faculty

Nehal Abu-Lail, David Bahr, Gustavo Barbosa-Canovas, Haluk Beyenal, Shane Brown, Shulin Chen, Denny Davis, Wenji Dong, David Field, Manuel Garcia-Perez, Md Hossain, B Jobson, Brian Lamb, Kelvin Lynn, George Mount, Pius Ndegwa, M Norton, James Petersen, Shyam Sablani, Claudio Stockle, Juming Tang, Jeffrey Ullman, Timothy Vanreken, Bernard Vanwie, Anita Vasavada, Michael Wolcott and Joan Wu.

English

Degree offered: Doctor of Philosophy (English)

Faculty working with graduate students: 38

Graduate students: 23

Graduate students receiving assistantships or scholarships: 91%

Tests required: GRE (Verbal), GRE (Quantitative), TOEFL

Deadline: :
Fall: January 10

Requirements

Qualifying exams (written); dissertation prospectus

Program Description

The Department of English at Washington State University offers graduate programs leading to the degrees of Master of Arts (M.A.) and Doctor of Philosophy (Ph.D.). Providing opportunities for diverse coursework and extensive pedagogical training, these programs emphasize interpretive and critical thinking, breadth of disciplinary preparation, grounding in current theory and methodology, and respect for the value of multiple perspectives. Students may elect to concentrate either on literary study (British, American, and postcolonial Anglophone literatures) or on rhetoric and composition. The English Department also participates in Washington State's interdisciplinary American Studies program, which offers opportunities for M.A. and Ph.D. students to take specialized seminars in American Studies.All students admitted to the various M.A. and Ph.D. programs will have been carefully selected from pools of applicants. They are expected to pursue their degree programs with success and to earn the M.A. degree in two years and the Ph.D. in four. The final oral examination - the culmination of all degree programs - is understood to be a conversation among colleagues, a forum in which the candidate discusses his or her own scholarly goals and asks questions as well as answering them. The intent is that it serve as a welcome into the profession of English studies.

Degree Description

Students entering the Ph.D. program in English are expected to have completed a master's degree in English or in a related field of study at an accredited college or university, and to show promise of doing excellent work at the doctoral level. Students who complete a master's degree at WSU must reApply for admission to the Ph.D. program. Ph.D. candidates must demonstrate general competence in two foreign languages or advanced competence in one (see Language Proficiency Requirements, below). All doctoral students are expected to take part actively in planning their own literary and language programs and in meeting deadlines set by the department and by the WSU Graduate School. The objective of the Ph.D. program - including concentrations either in literature or in rhetoric and composition - is to prepare scholars for employment in a wide variety of post-secondary institutions of learning by providing both generalized and specialized training in literary/cultural theory and criticism, as well as opportunities to develop critical and research skills in literary and intellectual history, rhetorical theory, genre studies, composition studies, pedagogical theory, linguistics, and other related fields. The Ph.D. candidate's course of study is not designed to confront the student with every significant piece of writing in the respective field (i.e., English and American literature or rhetoric and composition). Rather, the coursework aims to produce mature critics and scholars who are widely read in English and American literature, knowledgeable about the methods of systematic scholarship, and competent to function professionally, not only in the modern university, but also in related research institutions such as historical societies, museums, and publishing firms.

Training and Professional Development Opportunities

See
http://libarts.wsu.edu/english/PhD.html

Post-Graduate Career Placements

See
http://libarts.wsu.edu/english/After%20graduation.html

Contact Information

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Fax: 509-335-2582
E-mail: sarah_white@wsu.edu

Faculty

Christopher Arigo, Kristin Arola, Nancy Bell, Joan Burbick, Todd Butler, Beth Buyserie, Donna Campbell, Peter Chilson, William Condon, Andrea Davis, Michael Delahoyde, Robert Eddy, Patricia Ericsson, Lynn Gordon, Rudyne Grigar, William Hamlin, Michael Hanly, Jon Hegglund, Desiree Hellegers, Crag Hill, Wendy Johnson, George Kennedy, Linda Kittell, Alexander Kuo, Debbie Lee, Lynn Levy, Thabiti Lewis, Louis McAuley, David Menchaca, Barbara Monroe, Pavithra Narayanan, Aaron Oforlea, Wendy Olson, Thomas Reed, Augusta Rohrbach, Susan Ross, Carol Siegel and Elizabeth Siler.

ENGL

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512 Introduction to Graduate Study 3

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531 Administering a Writing Program 3 Prereq graduate standing. Combining theory and practice in writing program supervision and management. Interns will work under direct faculty supervision.

532 Teaching Writing to Nontraditional Students 3 Prereq Engl 501. Theory and practice of the teaching of basic writers.

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573 Seminar in American Literature 3 May be repeated for credit; cumulative maximum 12 hours. Major topics and figures.

580 Seminar in Medieval Literature 3 May be repeated for credit; cumulative maximum 6 hours. The literature of western Europe from 450 to 1500.

584 English Literature of the 16th Century 3 Graduate-level counterpart of Engl 484; additional requirements. Credit not granted for both Engl 484 and 584.

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595 Topics in English 3 May be repeated for credit; cumulative maximum 6 hours. Language, English pedagogy, or literature of special or current interest; reading theories, teaching of writing, current literary theories.

597 Topics in Composition and Rhetoric 3 May be repeated for credit; cumulative maximum 6 hours. Rhetoric and composition theory and praxis.

598 Teaching Apprenticeship 1 May be repeated for credit.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

English

Degree offered: Master of Arts in English

Faculty working with graduate students: 38

Graduate students: 21

Graduate students receiving assistantships or scholarships: 95%

Tests required: GRE (Verbal), GRE (Quantitative), TOEFL

Deadline: :
Fall: January 10

Program Description

The Department of English at Washington State University offers graduate programs leading to the degrees of Master of Arts (M.A.) and Doctor of Philosophy (Ph.D.). Providing opportunities for diverse coursework and extensive pedagogical training, these programs emphasize interpretive and critical thinking, breadth of disciplinary preparation, grounding in current theory and methodology, and respect for the value of multiple perspectives. Students may elect to concentrate either on literary study (British, American, and postcolonial Anglophone literatures) or on rhetoric and composition. The English Department also participates in Washington State's interdisciplinary American Studies program, which offers opportunities for M.A. and Ph.D. students to take specialized seminars in American Studies.All students admitted to the various M.A. and Ph.D. programs will have been carefully selected from pools of applicants. They are expected to pursue their degree programs with success and to earn the M.A. degree in two years and the Ph.D. in four. The final oral examination - the culmination of all degree programs - is understood to be a conversation among colleagues, a forum in which the candidate discusses his or her own scholarly goals and asks questions as well as answering them. The intent is that it serve as a welcome into the profession of English studies.

Degree Description

Master of Arts in English: Literature EmphasisThis broad program provides a solid foundation for more specialized doctoral study in English or American literature, American studies, comparative literature, or postcolonial anglophone literatures, as well as for professional training in such areas as law, information technology, divinity, journalism, and business. Students pursuing an M.A. in literature may choose either to write a thesis or to prepare a final portfolio.Master of Arts in English: Rhetoric and Composition EmphasisThis program allows students to specialize in the theory and pedagogy of composition. The degree is designed to prepare candidates for teaching positions at the college level or for doctoral programs with a specialization in composition and rhetoric. Language proficiency requirements are based on the candidate's expected needs and may be met by linguistics or other language studies. Candidates in this degree option must fulfill the following requirements.

Training and Professional Development Opportunities

See
http://libarts.wsu.edu/english/malit.htmlSe
e
http://libarts.wsu.edu/english/marhetcomp
.html

Post-Graduate Career Placements

See
http://libarts.wsu.edu/english/After%20gra
duation.html

Contact Information

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English

Degree offered: Master of Arts in English - Non Thesis

Faculty working with graduate students: 38

Graduate students: 21

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Deadline: :
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Entomology

Degree offered: Doctor of Philosophy (Entomology)

Faculty working with graduate students: 30

Graduate students: 30

Graduate students receiving assistantships or scholarships: 100%

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal), TOEFL, TOEFLI

Deadline: Fall: March 25
Spring: August 31

Requirements

Collegiate teaching experience is required. This can include the preparation, introductory remarks and conduct of at least three lecture or lab sessions for an entomology course. Doctoral students are required to participate in at least five 1-credit seminars.

Program Description

The Entomology Program at Washington State University provides it's students the opportunity to work on real world issues that support a safe, sustainable and abundant food supply; address human and animal health issues; and the protection of many other natural resources. Entomology graduate students are able to tailor their individual research program based their specific interests. The Entomology Graduate Program encourages the interaction of students with leaders in the field of entomology locally, nationally and world-wide. We have an excellent history of producing graduates who go on to lucrative careers in their area of expertise and to professionally follow their passion.

Degree Description

The Department of Entomology offers graduate programs leading to Doctoral and Master's of Science degrees. The curriculum provides the opportunity to study the basic and applied aspects of the science. Facilities and training are available for graduate study in major areas of entomology, including (but not limited to) apiculture; behavior; integrated biological control and sustainable pest management; ecology; forest entomology; insect/plant interactions; medical/veterinary entomology; population genetics; physiology; systematic; biological diversity and environmental toxicology. Departmental faculty, adjunct faculty, and affiliate faculty may all serve as student advisors. Faculty are housed both on campus and at research stations throughout the state; the ability to significantly interact with both on- and off-campus advisors and mentors offers students opportunities and perspectives not available in most programs. We maintain strong cooperative interactions with the USDA ARS lab in Yakima, Washington. Students whose major advisor resides at a Research & Extension Center (Wenatchee, Prosser, Puyallup, Mt. Vernon or USDA Wapato) typically come to Pullman for at least two semesters then relocate to the center where they will conduct their research and take the remainder of their coursework via AMS/WECN. Each student's program of study is individualized based on their research interests, prior academic experience, and collaboration with their major advisor.

Training and Professional Development Opportunities

Students have access to excellent labs and greenhouse facilities on the Pullman campus and at Research and Extension centers located throughout Washington State. Students are encouraged to attend Entomological Society of America meetings, as well as other professional meetings, where they present their research, and learn from other scientists in their chosen field.

Post-Graduate Employment Opportunities

New opportunities open everyday for entomology graduates that include: federal government agencies (EPA, USDA, APHIS); state departments of agriculture and ecology; state agricultural research stations; university extension service; agrichemical company field representatives in research and sales; agricultural consulting firms; private agribusiness firms; timber and seed production companies; international development agencies;pest control operators; parkland and golf course pest management specialists; mosquito abatement districts; weed control districts; food processing industry; ornamental plant protection; public health service; industrial pest control consultant; the armed forces and homeland security.

Post-Graduate Career Placements

The Entomology Department has excellent record of career placement for its graduates nationally and internationally. Our graduates have found careers in teaching, research and extension at colleges and universities; with federal and state agencies (e.g. USDA, FDA, and Washington State Department of Agriculture); in private industry; entrepreneurial endeavors; pesticide education programs; and forensics laboratories.

Contact Information

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E-mail: entom@wsu.edu

Faculty

Carol Anelli, Elizabeth Beers, John Brown, Jay Brunner, Allan Felsot, Stephen Garczynski, Laurel Hansen, Vincent Hebert, David Horton, David James, Andrew Jensen, Vincent Jones, Peter Landolt, Laura Lavine, Bethany Marshall, Joseph Munyaneza, Jeb Owen, Merrill Peterson, Keith Pike, Gary Piper, Carol Ramsay, Walter Sheppard, William Snyder, John Stark, Daniel Suomi, Lynell Tanigoshi, Thomas Unruh, Doug Walsh, Terry Whitworth and Richard Zack.

BIOL

352 **Cell Physiology** 3 Prereq Biol 107, organic chemistry, certified major. Function and control at the cell-tissue level.

372 **General Ecology** 4 (3-3) Prereq Biol 106, one semester chemistry. Relationship of organisms with physical and biotic components of their environment at the population, community, and ecosystem level.

CHEM

332 **Physical Chemistry** 3 Prereq Math 220; Chem 331 each with a grade of C or better. Elementary quantum theory; molecular structure and spectra; bonding theory; reaction rates; photochemistry and radiation chemistry; energy states and statistical thermodynamics.

ENTOM

340 **Agricultural Entomology** 3 (2-3) Prereq Biol 106, 107. Control, identification, and biology of insects and related arthropods. Course equivalent to OSU's Ent 311 and UI's Ent 322.

343 **General Entomology** 3 Biology, natural history, and importance of insects and related arthropods.

361 **Honey Bee Biology** 3 Biology of the honey bee, including behavior, genetics, evolution, pollination, sociality, and beekeeping practices.

539 **Insect Identification** 4 Survey of approximately 200 major families; collecting and preservation techniques.

540 **Taxonomy of Immature Insects** 2 or 4 Identification of eggs, larvae, nymphs, and pupal stages of insects. Insect collection required.

541 **Insect Ecology** 3 (2-3) Prereq Entom 343 or general ecology course. Population and community dynamics set in a systems framework; theory and applications in natural and altered systems. Requirements for graduate credit include a longer (10 vs. 5 pages), more synthetic term paper, and each 500-level student will lead a web-based or in-class discussion on a research paper of their choice. Two 1-day field trips. Credit not granted for both Entom 441 and 541.

545 **Insect-Plant Interactions** 3 (2-3) Prereq Entom 343. Ecology, evolution, and mechanisms of the interactions between insects and plants. Requirements for graduate credit include formal report of field study, term paper. (Alt/yrs). Credit not allowed for both Entom 445 and 545.

546 **Host Plant Resistance to Insects and Pathogens** 3 Prereq one semester calculus, graduate standing. Principles and methodologies for developing pest-resistant crop varieties. Requirements for graduate credit include preparation of grant proposal, classroom presentation. Field trips. (Alt/yrs). Credit not granted for both Entom 446 and 546.

548 **Medical and Veterinary Entomology** 3 Graduate-level counterpart of Entom 448, additional requirements. Credit not granted for both Entom 448 and 548.

550 **Insect Physiology** 3 Prereq Biol 322, BIOL 352, CHEM 240, ENTOM 340, or ENTOM 343. General principles of insect physiology; the mechanisms of vital processes in insects; organ, cellular, subcellular, chemical and physical levels.

556 **Insecticides: Toxicology and Mode of Action** 1 Prereq biochemistry, organic chemistry, physiology, plant or animal physiology. Insecticides in terms of historical perspective, classification, synthesis, toxicity, mode of action, and metabolism.

557 **Herbicides: Toxicology and Mode of Action** 1 Prereq biochemistry, organic chemistry, physiology, plant or animal physiology. Herbicides in terms of historical perspective, classification, synthesis, toxicity, mode of action, and metabolism.

558 **Pesticide Topics** 1 Prereq biochemistry, organic chemistry, physiology, plant or animal physiology. Current issues concerning pesticides in terms of toxicity, mode of action, and metabolism.

572 **Aquatic Entomology** 3 (1-6) Identification and biology of insects associated with aquatic and subaquatic environments. Additional projects/assignments required for graduate credit. One lec and two 3-hr labs a wk; two 1-day field trips. (Spring, alt/yrs). Credit not granted for both Entom 472 and 572.

593 **Seminar** 1 May be repeated for credit. Prereq 20 hours biology. Reporting and discussing problems and research in entomology.

700 **Master's Research, Thesis, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 **Doctoral Research, Dissertation, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

GEOL

102 **Physical Geology** 4 (3-3) For science majors and honors students. Modern concepts of earth science; mineral rock, resource, and map study. Field trip required. Credit not granted for both Geol 101 and 102.

Integrated Pest Management

IPM

201 **Introduction to Pest Management in a Quality Environment** 2 Pest management to maximize plant protection and safeguard the quality of the environment.

452 **Pesticides and the Environment** 2 Immediate and prolonged effects of pesticides on human and other animals; legal and moral repercussions of pesticide use.

462 **Systems of Integrated Pest Management** 3 (2-3) Utilization of the systems approach in agricultural pest management; design, implementation, and analysis of IPM programs for selected crops.

Integrated Pest Management

MBIOS

301 **General Genetics** 4 Prereq Biol 106 or 120; Biol 107; two semesters Chem. Principles of modern and classical genetics. Credit not normally granted for MBioS 301/Biol 301 and Biol 408.

303 **Introductory Biochemistry** 4 Prereq Chem 106; Chem 345. Modern biochemistry for undergraduates in the biological sciences.

514 General Biochemistry 3 Prereq MBioS 413, or graduate standing. Graduate-level counterpart of MBioS 414; additional requirements. Credit not granted for both 414 and 514.

Integrated Pest Management

PHYS

101 General Physics 4 (3-3) Prereq Math 107 or 108 with a grade of C or better, or math placement into calculus, or passing Math 140, 171, 202, or 206. Algebra/trigonometry-based physics; topics in mechanics, wave phenomena, temperature, and heat; oriented toward non-physical science majors. Credit not granted for more than one of Phys 101, 201, or 205.

102 General Physics 4 (3-3) Prereq Phys 101 with a grade of C or better; Math 107 or 108 with a grade of C or better, or math placement into calculus, or passing Math 140, 171, 202, or 206. Algebra/trigonometry-based physics; topics in electricity, magnetism, optical phenomena, relativity, and quantum theory; oriented toward non-physical science majors. Credit not granted for more than one of Phys 102, 202, or 206.

Integrated Pest Management

SOILS

413 Soil and Environmental Physics 3 (2-3) Prereq Math 107; Geol 101, 102 or SoilS 201. Physical properties of soils and their relationships to moisture, aeration, and temperature, plant-soil-atmospheric relationships, solute transport and soil salinity.

Integrated Pest Management

STAT

512 Statistical Methods in Research II 3 (2-2) Prereq Stat 412 or equivalent. Analysis and interpretation of designed experiments: CRD, RCBD, spit-plot and repeated measures, multiple comparisons, multiple regression modeling, validation of assumptions.

Entomology

Degree offered: Master of Science in Entomology

Faculty working with graduate students: 30

Graduate students: 30

Graduate students receiving assistantships or scholarships: 100%

Tests required: GRE (Combined), TOEFL, TOEFLI, GRE (Quantitative), GRE (Verbal)

Deadline: Fall: March 25
Spring: August 31

Requirements

Collegiate teaching experience is required. This can include the preparation, introductory remarks and conduct of at least three lecture or lab sessions for an entomology course. Master's students are required to participate in two 1-credit seminars.

Program Description

The Entomology Program at Washington State University provides it's students the opportunity to work on real world issues that support a safe, sustainable and abundant food supply; address human and animal health issues; and the protection of many other natural resources. Entomology graduate students are able to tailor their individual research program based their specific interests. The Entomology Graduate Program encourages the interaction of students with leaders in the field of entomology locally, nationally and world-wide. We have an excellent history of producing graduates who go on to lucrative careers in their area of expertise and to professionally follow their passion.

Degree Description

The Department of Entomology offers graduate programs leading to Doctoral and Master's of Science degrees. The curriculum provides the opportunity to study the basic and applied aspects of the science. Facilities and training are available for graduate study in major areas of entomology, including (but not limited to) apiculture; behavior; integrated biological control and sustainable pest management; ecology; forest entomology; insect/plant interactions; medical/veterinary entomology; population genetics; physiology; systematic; biological diversity and environmental toxicology. Departmental faculty, adjunct faculty, and affiliate faculty may all serve as student advisors. Faculty are housed both on campus and at research stations throughout the state; the ability to significantly interact with both on- and off-campus advisors and mentors offers students opportunities and perspectives not available in most programs. We maintain strong cooperative interactions with the USDA ARS lab in Yakima, Washington. Students whose major advisor resides at a Research & Extension Center (Wenatchee, Prosser, Puyallup, Mt. Vernon or USDA Wapato) typically come to Pullman for at least two semesters then relocate to the center where they will conduct their research and take the remainder of their coursework via AMS/WECN. Each student's program of study is individualized based on their research interests, prior academic experience, and collaboration with their major advisor.

Training and Professional Development Opportunities

Students have access to excellent labs and greenhouse facilities on the Pullman campus and at Research and Extension centers located throughout Washington State. Students are encouraged to attend Entomological Society of America meetings, as well as other professional meetings, where they present their research, and learn from other scientists in their chosen field.

Post-Graduate Employment Opportunities

New opportunities open everyday for entomology graduates that include: federal government agencies (EPA, USDA, APHIS); state departments of agriculture and ecology; state agricultural research stations; university extension service; agrichemical company field representatives in research and sales; agricultural consulting firms; private agribusiness firms; timber and seed production companies; international development agencies;pest control operators; parkland and golf course pest management specialists; mosquito abatement districts; weed control districts; food processing industry; ornamental plant protection; public health service; industrial pest control consultant; the armed forces and homeland security.

Post-Graduate Career Placements

The Entomology Department has excellent record of career placement for its graduates nationally and internationally. Our graduates have found careers in teaching, research and extension at colleges and universities; with federal and state agencies (e.g. USDA, FDA, and Washington State Department of Agriculture); in private industry; entrepreneurial endeavors; pesticide education programs; forensics laboratories.

Contact Information

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Faculty

Carol Anelli, Elizabeth Beers, John Brown, Jay Brunner, Allan Felsot, Stephen Garczynski, Laurel Hansen, Vincent Hebert, David Horton, David James, Andrew Jensen, Vincent Jones, Peter Landolt, Laura Lavine, Bethany Marshall, Joseph Munyaneza, Jeb Owen, Merrill Peterson, Keith Pike, Gary Piper, Carol Ramsay, Walter Sheppard, William Snyder, John Stark, Daniel Suomi, Lynell Tanigoshi, Thomas Unruh, Doug Walsh, Terry Whitworth and Richard Zack.

BIOL

352 **Cell Physiology** 3 Prereq Biol 107, organic chemistry, certified major. Function and control at the cell-tissue level.

372 **General Ecology** 4 (3-3) Prereq Biol 106, one semester chemistry. Relationship of organisms with physical and biotic components of their environment at the population, community, and ecosystem level.

CHEM

332 **Physical Chemistry** 3 Prereq Math 220; Chem 331 each with a grade of C or better. Elementary quantum theory; molecular structure and spectra; bonding theory; reaction rates; photochemistry and radiation chemistry; energy states and statistical thermodynamics.

ENTOM

340 **Agricultural Entomology** 3 (2-3) Prereq Biol 106, 107. Control, identification, and biology of insects and related arthropods. Course equivalent to OSU's Ent 311 and UI's Ent 322.

343 **General Entomology** 3 Biology, natural history, and importance of insects and related arthropods.

361 **Honey Bee Biology** 3 Biology of the honey bee, including behavior, genetics, evolution, pollination, sociality, and beekeeping practices.

539 **Insect Identification** 4 Survey of approximately 200 major families; collecting and preservation techniques.

540 **Taxonomy of Immature Insects** 2 or 4 Identification of eggs, larvae, nymphs, and pupal stages of insects. Insect collection required.

541 **Insect Ecology** 3 (2-3) Prereq Entom 343 or general ecology course. Population and community dynamics set in a systems framework; theory and applications in natural and altered systems. Requirements for graduate credit include a longer (10 vs. 5 pages), more synthetic term paper, and each 500-level student will lead a web-based or in-class discussion on a research paper of their choice. Two 1-day field trips. Credit not granted for both Entom 441 and 541.

545 **Insect-Plant Interactions** 3 (2-3) Prereq Entom 343. Ecology, evolution, and mechanisms of the interactions between insects and plants. Requirements for graduate credit include formal report of field study, term paper. (Alt/yrs). Credit not allowed for both Entom 445 and 545.

546 **Host Plant Resistance to Insects and Pathogens** 3 Prereq one semester calculus, graduate standing. Principles and methodologies for developing pest-resistant crop varieties. Requirements for graduate credit include preparation of grant proposal, classroom presentation. Field trips. (Alt/yrs). Credit not granted for both Entom 446 and 546.

548 **Medical and Veterinary Entomology** 3 Graduate-level counterpart of Entom 448, additional requirements. Credit not granted for both Entom 448 and 548.

550 **Insect Physiology** 3 Prereq Biol 322, BIOL 352, CHEM 240, ENTOM 340, or ENTOM 343. General principles of insect physiology; the mechanisms of vital processes in insects; organ, cellular, subcellular, chemical and physical levels.

556 **Insecticides: Toxicology and Mode of Action** 1 Prereq biochemistry, organic chemistry, physiology, plant or animal physiology. Insecticides in terms of historical perspective, classification, synthesis, toxicity, mode of action, and metabolism.

557 **Herbicides: Toxicology and Mode of Action** 1 Prereq biochemistry, organic chemistry, physiology, plant or animal physiology. Herbicides in terms of historical perspective, classification, synthesis, toxicity, mode of action, and metabolism.

558 **Pesticide Topics** 1 Prereq biochemistry, organic chemistry, physiology, plant or animal physiology. Current issues concerning pesticides in terms of toxicity, mode of action, and metabolism.

572 **Aquatic Entomology** 3 (1-6) Identification and biology of insects associated with aquatic and subaquatic environments. Additional projects/assignments required for graduate credit. One lec and two 3-hr labs a wk; two 1-day field trips. (Spring, alt/yrs). Credit not granted for both Entom 472 and 572.

593 **Seminar** 1 May be repeated for credit. Prereq 20 hours biology. Reporting and discussing problems and research in entomology.

700 **Master's Research, Thesis, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

Integrated Pest Management

IPM

452 **Pesticides and the Environment** 2 Immediate and prolonged effects of pesticides on human and other animals; legal and moral repercussions of pesticide use.

462 **Systems of Integrated Pest Management** 3 (2-3) Utilization of the systems approach in agricultural pest management; design, implementation, and analysis of IPM programs for selected crops.

Integrated Pest Management

MBIOS

301 **General Genetics** 4 Prereq Biol 106 or 120; Biol 107; two semesters Chem. Principles of modern and classical genetics. Credit not normally granted for MBioS 301/Biol 301 and Biol 408.

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Integrated Pest Management

SOILS

413 **Soil and Environmental Physics** 3 (2-3) Prereq Math 107; Geol 101, 102 or SoilS 201. Physical properties of soils and their relationships to moisture, aeration, and temperature, plant-soil-atmospheric relationships, solute transport and soil salinity.

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STAT

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Entomology

Degree offered: Master of Science in Entomology - Non Thesis

Faculty working with graduate students: 30

Graduate students: 30

Graduate students receiving assistantships or scholarships: 100%

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal), IELTS, TOEFL, TOEFLI

Deadline: Fall: March 25
Spring: August 31

Requirements

Collegiate teaching experience is required. This can include the preparation, introductory remarks and conduct of at least three lecture or lab sessions for an entomology course. Master's students are required to participate in two 1-credit seminars.

Program Description

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The Department of Entomology offers graduate programs leading to Doctoral and Master's of Science degrees. The curriculum provides the opportunity to study the basic and applied aspects of the science. Facilities and training are available for graduate study in major areas of entomology, including (but not limited to) apiculture; behavior; integrated biological control and sustainable pest management; ecology; forest entomology; insect/plant interactions; medical/veterinary entomology; population genetics; physiology; systematic; biological diversity and environmental toxicology. Departmental faculty, adjunct faculty, and affiliate faculty may all serve as student advisors. Faculty are housed both on campus and at research stations throughout the state; the ability to significantly interact with both on- and off-campus advisors and mentors offers students opportunities and perspectives not available in most programs. We maintain strong cooperative interactions with the USDA ARS lab in Yakima, Washington. Students whose major advisor resides at a Research & Extension Center (Wenatchee, Prosser, Puyallup, Mt. Vernon or USDA Wapato) typically come to Pullman for at least two semesters then relocate to the center where they will conduct their research and take the remainder of their coursework via AMS/WECN. Each student's program of study is individualized based on their research interests, prior academic experience, and collaboration with their major advisor.

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Post-Graduate Career Placements

The Entomology Department has excellent record of career placement for its graduates nationally and internationally. Our graduates have found careers in teaching, research and extension at colleges and universities; with federal and state agencies (e.g. USDA, FDA, and Washington State Department of Agriculture); in private industry; entrepreneurial endeavors; pesticide education programs; forensics laboratories.

Contact Information

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558 Pesticide Topics 1 Prereq biochemistry, organic chemistry, physiology, plant or animal physiology. Current issues concerning pesticides in terms of toxicity, mode of action, and metabolism.

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590 Special Topics in Entomology V 1-4 May be repeated for credit; cumulative maximum 10 hours. Graduate-level counterpart of Entom 490; additional requirements. Credit not granted for both Entom 490 and 590.

593 Seminar 1 May be repeated for credit. Prereq 20 hours biology. Reporting and discussing problems and research in entomology.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Integrated Pest Management

IPM

452 Pesticides and the Environment 2 Immediate and prolonged effects of pesticides on human and other animals; legal and moral repercussions of pesticide use.

462 Systems of Integrated Pest Management 3 (2-3) Utilization of the systems approach in agricultural pest management; design, implementation, and analysis of IPM programs for selected crops.

Integrated Pest Management

MBIOS

301 General Genetics 4 Prereq Biol 106 or 120; Biol 107; two semesters Chem. Principles of modern and classical genetics. Credit not normally granted for MBioS 301/Biol 301 and Biol 408.

303 Introductory Biochemistry 4 Prereq Chem 106; Chem 345. Modern biochemistry for undergraduates in the biological sciences.

514 General Biochemistry 3 Prereq MBioS 413, or graduate standing. Graduate-level counterpart of MBioS 414; additional requirements. Credit not granted for both 414 and 514.

Integrated Pest Management

SOILS

413 Soil and Environmental Physics 3 (2-3) Prereq Math 107; Geol 101, 102 or SoilS 201. Physical properties of soils and their relationships to moisture, aeration, and temperature, plant-soil-atmospheric relationships, solute transport and soil salinity.

Integrated Pest Management

STAT

512 Statistical Methods in Research II 3 (2-2) Prereq Stat 412 or equivalent. Analysis and interpretation of designed experiments: CRD, RCBD, spit-plot and repeated measures, multiple comparisons, multiple regression modeling, validation of assumptions.

Environmental and Natural Resource Sciences

Degree offered: Doctor of Philosophy (Environmental and Natural Resource Sciences)

Faculty working with graduate students: 10

Graduate students: 19

Graduate students receiving assistantships or scholarships: 100%

Program offered: Pullman, Tri-Cities, Vancouver

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 15
Spring: October 15

Requirements

Please see the program/department for more information.

Contact Information

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Faculty

Allyson Beall, Michael Berger, Stephen Bollens, M Chappell, Frederick Ford, John Harrison, Stephen Henderson, Cailin Orr, Gretchen Rollwagen-Bollens and Brian Tissot.

Environmental Engineering

Degree offered: Master of Science in Environmental Engineering

Faculty working with graduate students: 32

Program offered: Pullman, Tri-Cities, Vancouver

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Program Description

The graduate programs in Environmental Engineering are offered leading to the Master of Science in Environmental Engineering degree. The department also participates in university programs leading to the M.S. in Environmental Science and the Ph.D. in Engineering Science. At the Master's level, specific programs are available within each area.

Degree Description

Students may be accepted into the graduate program with undergraduate degrees in other than Civil or environmental Engineering (e.g., related areas such as mechanical engineering, materials science, environmental science, etc.). These students, however, may need to complete additional courses to cover deficiencies. Courses taken to satisfy deficiencies cannot be included in the program of study. Each student, in consultation with his/her graduate committee, will develop a plan of study. This plan outlines what courses will be required for completion of the degree. To develop a plan of study, students may choose from a variety of graduate and selected undergraduate courses offered in the area of emphasis. In addition, courses may be selected from a number of related courses in other programs in the Department of Civil and Environmental Engineering, as well as in other departments of the University.

Contact Information

Dr. Balasingam Muhunthan
Graduate Committee Chair

Vicki Ruddick
Graduate Coordinator

Faculty

Jennifer Adam, Michael Barber, Donald Bender, Marc Beutel, Shane Brown, Phillip Butterfield, Serena Chung, Candis Claiborn, William Cofer, James Dolan, Karl Englund, Liv Haselbach, Md Hossain, B Jobson, Brian Lamb, Fok-Yan Leung, Heping Liu, David McLean, George Mount, Balasingam Muhunthan, David Pollock, Shelley Pressley, Pizhong Qiao, Shihui Shen, Timothy Vanreken, Joseph Vaughan, Richard Watts, Haifang Wen, Michael Wolcott, Vikram Yadama, David Yonge and Jinwen Zhang.

Environmental Engineering

Degree offered: Master of Science in Environmental Engineering - Non Thesis

Faculty working with graduate students: 32

Program offered: Pullman, Tri-Cities

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Program Description

The graduate programs in Environmental Engineering are offered leading to the Master of Science in Environmental Engineering degree. The department also participates in university programs leading to the M.S. in Environmental Science and the Ph.D. in Engineering Science. At the Master's level, specific programs are available within each area.

Degree Description

Students may be accepted into the graduate program with undergraduate degrees in other than Civil or environmental Engineering (e.g., related areas such as mechanical engineering, materials science, environmental science, etc.). These students, however, may need to complete additional courses to cover deficiencies. Courses taken to satisfy deficiencies cannot be included in the program of study. Each student, in consultation with his/her graduate committee, will develop a plan of study. This plan outlines what courses will be required for completion of the degree. To develop a plan of study, students may choose from a variety of graduate and selected undergraduate courses offered in the area of emphasis. In addition, courses may be selected from a number of related courses in other programs in the Department of Civil and Environmental Engineering, as well as in other departments of the University.

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Environmental Science

Degree offered: Master of Science in Environmental Science

Faculty working with graduate students: 11

Graduate students: 39

Graduate students receiving assistantships or scholarships: 74%

Program offered: Pullman, Tri-Cities, Vancouver

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 15
Spring: October 15

Program Description

The School of Earth & Environmental Sciences (SEES) is a new unit established August, 2006 comprised of the former Program in Environmental Science & Regional Planning and Department of Geology. The School offers a: * Master of Science in Environmental Science, * Master of Science in Geology, * Doctor of Philosophy in Environmental and Natural Resource Sciences) and * Doctor of Philosophy in Geology. The Masters degree in Environmental Science is offered at WSU Tri-Cities and WSU Vancouver, as well as at WSU-Pullman.

Degree Description

The MS degree is an interdisciplinary program with the flexibility for elective classes in the student's own area of specialization. In consultation with their advisor, students may select classes from a wide variety of areas (i.e., ecosystem science and management, ecological planning, land and water conservation, air quality management, water quality management, energy and carbon policy, etc.). Most students conclude their MS studies with a thesis, where the goal is a publishable contribution. The requirements are given below and are subject to completion after entering the masters program.

Contact Information

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Faculty

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Environmental Science & Regional Planning

ES/RP

544 Environmental Assessment 4 Graduate-level counterpart of ES/RP 444; additional requirements. Credit not granted for both ES/RP 444 and 544.

550 System Dynamics Models of Environmental Systems 3 Prereq graduate standing. Analysis of environmental system dynamics; development and uses of simulation models using the Stella software on Macintosh.

569 Ecosystem Ecology and Global Change 3 Prereq graduate standing. Same as Biol 569. Graduate-level counterpart of ES/RP 469; additional requirements. Credit not granted for both ES/RP 469 and 569.

590 **Special Topics** 2 May be repeated for credit; cumulative maximum 6 hours.

592 **Special Topics** V 1-4 May be repeated for credit; cumulative maximum 4 hours. May be repeated for credit; cumulative maximum 4 hours.

593 **Seminar in Environmental Science and Regional Planning** 1 May be repeated for credit; cumulative maximum 8 hours. May be repeated for credit, cumulative maximum 8 hours.

700 **Master's Research, Thesis, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

Environmental Science

Degree offered: Master of Science in Environmental Science - Non Thesis

Faculty working with graduate students: 11

Graduate students: 7

Program offered: Pullman, Tri-Cities, Vancouver

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 15
Spring: October 15

Program Description

The School of Earth & Environmental Sciences (SEES) is a new unit established August, 2006 comprised of the former Program in Environmental Science & Regional Planning and Department of Geology. The School offers a: * Master of Science in Environmental Science, * Master of Science in Geology, * Doctor of Philosophy in Environmental and Natural Resource Sciences) and * Doctor of Philosophy in Geology. The Masters degree in Environmental Science is offered at WSU Tri-Cities and WSU Vancouver, as well as at WSU-Pullman.

Degree Description

After consultation with their advisor, some students may decide to produce a project rather than a thesis. This option may be preferable for students who wish to take additional course work and want a more flexible format for the project report. This option requires a final oral exam to test the candidate's knowledge of Environmental Science with emphasis on the work presented in the project report. The project requires 4 credits of ESRP 702 (rather than 6 credits of ESRP 700) and 2 additional hours of course work. The requirements are given below and are subject to completion after entering the masters program.

Contact Information

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Faculty

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Environmental Science & Regional Planning

ES/RP

544 **Environmental Assessment** 4 Graduate-level counterpart of ES/RP 444; additional requirements. Credit not granted for both ES/RP 444 and 544.

550 **System Dynamics Models of Environmental Systems** 3 Prereq graduate standing. Analysis of environmental system dynamics; development and uses of simulation models using the Stella software on Macintosh.

569 **Ecosystem Ecology and Global Change** 3 Prereq graduate standing. Same as Biol 569. Graduate-level counterpart of ES/RP 469; additional requirements. Credit not granted for both ES/RP 469 and 569.

590 **Special Topics** 2 May be repeated for credit; cumulative maximum 6 hours.

592 **Special Topics** V 1-4 May be repeated for credit; cumulative maximum 4 hours. May be repeated for credit; cumulative maximum 4 hours.

593 **Seminar in Environmental Science and Regional Planning** 1 May be repeated for credit; cumulative maximum 8 hours. May be repeated for credit, cumulative maximum 8 hours.

702 **Master's Special Problems, Directed Study, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

Exercise Science - Certificate in Exercise Science

Degree offered: Graduate Certificate in Exercise Science

Program offered: Spokane

Tests required: GRE (Combined), TOEFL

Deadline: Fall: February 1

Program Description

WSU Spokane offers the only research-based Exercise Science graduate program in Washington State that focuses on clinical and experimental exercise physiology with an emphasis on cellular and molecular mechanisms.The core curriculum provides a foundation in the study of the cellular mechanisms that regulate physiological responses to exercise and the molecular mechanisms that govern these cellular responses. Research methods and statistics courses provide preparatory study in research design and analysis for future project/thesis work.

Degree Description

The Master of Science Coordinated Program in Dietetics Nutrition and Exercise Physiology is designed for those individuals whose career goal is to become eligible to take the registration examination for dietitians through the American Dietetic Association, Graduates of the program are expected to function effectively as entry-level dietetics practitioners in a clinical, administrative, or community setting. The supervised practice experience requirement is currently 1200 hours. The 1200 hours of supervised practice consists of 160 hours in a food management rotation, 440 hours in a clinical rotation, 200 hours in a community rotation, and 400 hours in an exercise physiology internship

Training and Professional Development Opportunities

Most registered dietitians work at hospitals and medical centers, private practice or other health-care facilities. Many work in community and public health settings, academia and research. Others work in food and nutrition industry and business, journalism, sports nutrition, corporate wellness programs and in other nontraditional settings.RDs work in:Hospitals, HMOs or other health care facilities, educating patients about nutrition and administering medical nutrition therapy as part of the health care team. They may also manage the foodservice operations in these settings, as well as in schools, day-care centers, and correctional facilities, overseeing everything from food purchasing and preparation to managing staff. Sports nutrition and corporate wellness programs, educating clients about the connection between food and fitness, health, and exercise performance. Food and nutrition-related businesses and industries, working in communications, consumer affairs, public relations, marketing, or product development. Private practice, working under contract with health care or food companies, or in their own business. RDs may provide services to foodservice or restaurant managers, food vendors and distributors, athletes, nursing home residents, or company employees. Community and public health settings

teaching monitoring, and advising the public, and helping to improve their quality of life through healthy eating habits. Universities and medical centers, teaching physicians, nurses, dietetics students and others the sophisticated science of foods and nutrition. Research areas, in food and pharmaceutical companies, universities, and hospitals, directing or conducting experiments to answer critical nutrition questions and find alternative foods or nutrition recommendations for the public.

Contact Information

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EXSCI

563 Exercise and Immune Response 3 Influence of physical exercise on immune response and consequent impact on host susceptibility to disease and infection.

565 Muscle Physiology and Exercise Biogenetics 3 Bioenergetic, striated muscle metabolic, and neuroendocrine responses to exercise and training.

567 Cardiopulmonary Exercise Physiology 3 Pulmonary, circulatory, thermoregulatory, fluid balance and physiological system integration responses to exercise and training.

568 Clinical Assessment and Prescription 3 Prereq ExSci 463, 476, 567. Development of knowledge and skills in clinical testing analysis, and exercise prescription for clinical populations.

Nutrition And Exercise Physiology

NEP

300 Professional Preparation 2 Prereq junior standing certified nutrition and exercise physiology major. ADA and ACSM standards of practice, code of ethics; societal and cultural issues that impact the health care industry.

320 Strength Training and Conditioning; Theory and Application 4 Prereq Biol 251; Biol 315 or MvtSt 262. Application of scientific principles of strength and conditioning as it relates to exercise training and sports.

340 Foods with Application to Physical Activity 3 (2-3) Prereq one semester of organic chemistry. Experimental approach to physical, chemical and sensory properties of foods; overview of culinary techniques, technology and application to physical activity.

362 Biomechanical Analysis 3 Prereq [N] GER math course; Biol 315 or MvtSt 262. Applied sport, clinical and occupational biomechanics.

400 Macronutrient Metabolism 3 Prereq introductory nutrition; biochemistry. Digestion, absorption, and metabolism of carbohydrates, protein and fats, and their utilization for energy.

401 Community Supervised Practice 9 Prereq completion of all nutrition and exercise physiology requirements through the 4th year. Advanced principles of community dietetic nutrition education along with hands-on community supervised practice experience.

402 Vitamin and Mineral Metabolism 2 Prereq NEP 400. Absorption and metabolism of vitamins and minerals and their role in macronutrient metabolism and nutritional requirements for maintenance of health.

427 Nutritional Assessment and Lifestyle Counseling 3 (2-3) Prereq MBioS 233; Psych 105. Basic skills and concepts of nutrition assessment and lifestyle counseling of ambulatory adults using dietary intakes, menu planning and communication skills.

435 Exercise, Diet and Disease 4 Prereq NEP 400; NEP 402; NEP 463. Pathophysiology of disease and implications for dietary and exercise interventions.

437 Diet Therapy 4 Prereq completion of all nutrition and exercise physiology requirements through the 4th year. Theoretical and practical base for diet modification and nutritional therapy in health and a variety of disease states.

440 Clinical Supervised Practice 11 Prereq completion of all nutrition and exercise physiology requirements through the 4th year. Professional supervised experience offsite in clinical dietetics. Meets American Dietetic Association requirements for registration eligibility.

450 Management and Facilities 3 Prereq senior standing; nutrition and exercise physiology major. Essential skills and guidelines for those in the health facility industry in establishing and maintaining a safe and proper facility.

451 Management Practices in Food Science 5 (1-12) Prereq completion of all nutrition and exercise physiology requirements through the 4th year. Advanced principles of food systems; institutional food service management along with offsite, hands-on food service supervised practice experience.

458 Nutrition and Exercise Throughout the Life Cycle 4 Prereq senior standing in nutrition and exercise physiology. Physical activity relating to nutritional needs and dietary patterns from infancy through old age and including maternal nutrition.

463 Advanced Exercise Physiology 4 (3-3) Prereq Biol 251; Biol 315 or MvtSt 262. Advanced undergraduate exercise physiology with emphasis on mechanisms regulating physiological responses to exercise across the life span.

465 Nutrition and Exercise Assessment 3 (2-3) Prereq NEP 400; NEP 463; NEP 427. Field and laboratory techniques and tools required to properly assess nutritional and physiological parameters.

470 Sports Nutrition 3 Prereq introductory nutrition; biochemistry; NEP 463. Identification of energy, macro/micronutrients and fluid requirements during exercise; evaluation of dietary practices and ergogenic aids for pre- and post-competition, weight maintenance.

473 Nutrition in the Community 2 Prereq completion of all nutrition and exercise physiology requirements through the 4th year. Public health nutrition including assessment of communities, problem list development, program planning and an overview of existing programs and services.

476 Exercise Testing and Prescription 3 (2-3) Prereq NEP 463. Principles of exercise testing and prescription based on current practices in physical education, physiology, and rehabilitation.

478 Electrocardiography, Medications and Procedures 3 (2-3) Prereq NEP 435; NEP 476. Development of ECG interpretation skills, including 12-leads, with emphasis on procedures and impact of medication in resting and exercising persons.

479 Nutrition and Exercise Practicum 3 (1-6) May be repeated for credit; cumulative maximum 6 hours. Prereq NEP 300; NEP 435; NEP 465; NEP 476. Supervised experience in applying exercise and nutrition assessment techniques and developing exercise and nutrition prescription for normal and diseased subjects.

480 Cardiopulmonary Rehabilitation 4 (3-3) Prereq NEP 465; NEP 478. Principles and applications of exercise and nutrition assessment/prescription and program management to cardiopulmonary and rehabilitation situations and populations.

490 Nutrition and Exercise Internship 10 (0-30) Prereq completion of all coursework for BS in nutrition and exercise physiology. Supervised offsite exercise and nutrition field experience to assess normal and diseased clients and develop/apply nutrition and exercise prescriptions.

501 Community Supervised Practice 5 (1-12) Prereq NEP 427; NEP 458. Review of literature in dietetic education and health promotion including supervised practice in community facilities.

505 Graduate Seminar V 2-3 May be repeated for credit; cumulative maximum 6 hours. Current issues and evaluation of literature related to nutrition, dietetics, exercise physiology practice and research.

510 Foundations of Cellular Regulation 3 Prereq Biol 251, Chem 345, MBioS 303. Fundamentals of pharmacology and toxicology; signal transduction; cellular effects of diet and exercise; action and regulation of dietary supplements.

520 Research Methods in Nutrition and Exercise Physiology 4 Current research designs and methods in nutrition and exercise physiology including behavioral and basic sciences emphasizing chronic disease prevention.

526 Advanced Community Nutrition and Health 3 Prereq Stat 412 or c//; NEP 476 or c//. Research basis of practice in community nutrition or health programs; assessment and outcome measures emphasizing chronic disease prevention.

537 Advanced Medical Nutrition Therapy 3 Prereq NEP 458. Exercise and nutrition assessment/prescription and program management in rehabilitation for populations in various disease states.

540 Clinical Supervised Practice 10 (1-27) Prereq NEP 537. Clinical supervised practical experience for graduate students in coordinated program in dietetics.

551 Management Practices in Food Service 4 (1-9) Prereq NEP 450. Advanced principles and supervised experience in food systems, institutional food service management, school food service and community feeding programs.

573 Nutrition in the Community 2 Prereq NEP 458. Public health from a nutrition perspective including current issues in nutrition healthcare, overview of existing programs and assessment of program planning.

580 Advanced Topics in Exercise Physiology 3 Prereq NEP 463. Advanced topics in cellular and molecular physiology.

585 Clinical Exercise Physiology 4 Prereq NEP 490. Exercise and nutrition assessment/prescription and program management in rehabilitation for populations in various disease states.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Exercise Science

Degree offered: Master of Science in Exercise Science

Faculty working with graduate students: 9

Graduate students: 3

Graduate students receiving assistantships or scholarships: 100%

Program offered: Spokane

Tests required: TOEFLI

Deadline: Fall: February 1

Program Description

WSU Spokane offers the only research-based Exercise Science graduate program in Washington State that focuses on clinical and experimental exercise physiology with an emphasis on cellular and molecular mechanisms.The core curriculum provides a foundation in the study of the cellular mechanisms that regulate physiological responses to exercise and the molecular mechanisms that govern these cellular responses. Research methods and statistics courses provide preparatory study in research design and analysis for future project/thesis work.

Degree Description

The MS NEP is a research-based graduate program that focuses on nutrition and exercise physiology. The thesis option emphasizes research in: 1) behavioral nutrition and 2) cellular/molecular mechanisms regulating physiological responses to exercise and nutrition. The graduate curriculum provides a foundation in the study of the cellular mechanisms that regulate physiological responses and the molecular mechanisms that govern these cellular responses.

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Faculty

Miriam Ballejos, Janet Beary, Sally Blank, Laura Frank, Madeline Houghton, Emily Johnson, Susan Marsh, Kathryn Meier and Jill Shultz.

EXSCI

501 Special Topics 3 Prereq admission to Clinical and Experimental Exercise Science graduate program. Special topics in exercise physiology and metabolism.

563 Exercise and Immune Response 3 Influence of physical exercise on immune response and consequent impact on host susceptibility to disease and infection.

565 Muscle Physiology and Exercise Biogenetics 3 Bioenergetic, striated muscle metabolic, and neuroendocrine responses to exercise and training.

567 Cardiopulmonary Exercise Physiology 3 Pulmonary, circulatory, thermoregulatory, fluid balance and physiological system integration responses to exercise and training.

568 Clinical Assessment and Prescription 3 Prereq ExSci 463, 476, 567. Development of knowledge and skills in clinical testing analysis, and exercise prescription for clinical populations.

589 Research Techniques V 2 (1-3) to 3 (2-3) Application and use of research techniques and tools in physiology of exercise.

590 Internship V 2-12 May be repeated for credit; cumulative maximum 12 hours. By interview only. Opportunity in an educational, industrial, municipal or private sports or recreational setting; direct participation in tasks, research and reporting activities.

596 Seminar V 1-2 May be repeated for credit.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

STAT

512 Statistical Methods in Research II 3 (2-2) Prereq Stat 412 or equivalent. Analysis and interpretation of designed experiments: CRD, RCBD, spit-plot and repeated measures, multiple comparisons, multiple regression modeling, validation of assumptions.

Exercise Science

Degree offered: Master of Science in Exercise Science - Non Thesis

Program offered: Spokane

Tests required: TOEFLI

Deadline: Fall: February 1

Program Description

WSU Spokane offers the only research-based Exercise Science graduate program in Washington State that focuses on clinical and experimental exercise physiology with an emphasis on cellular and molecular mechanisms.The core curriculum provides a foundation in the study of the cellular mechanisms that regulate physiological responses to exercise and the molecular mechanisms that govern these cellular responses. Research methods and statistics courses provide preparatory study in research design and analysis for future project/thesis work.

Degree Description

The MS NEP is a research-based graduate program that focuses on nutrition and exercise physiology. The non thesis option focuses on clinical nutrition and exercise physiology. The graduate curriculum provides a foundation in the study of the cellular mechanisms that regulate physiological responses and the molecular mechanisms that govern these cellular responses.

EXSCI

501 Special Topics 3 Prereq admission to Clinical and Experimental Exercise Science graduate program. Special topics in exercise physiology and metabolism.

563 Exercise and Immune Response 3 Influence of physical exercise on immune response and consequent impact on host susceptibility to disease and infection.

565 Muscle Physiology and Exercise Biogenetics 3 Bioenergetic, striated muscle metabolic, and neuroendocrine responses to exercise and training.

567 Cardiopulmonary Exercise Physiology 3 Pulmonary, circulatory, thermoregulatory, fluid balance and physiological system integration responses to exercise and training.

568 Clinical Assessment and Prescription 3 Prereq ExSci 463, 476, 567. Development of knowledge and skills in clinical testing analysis, and exercise prescription for clinical populations.

589 Research Techniques V 2 (1-3) to 3 (2-3) Application and use of research techniques and tools in physiology of exercise.

590 Internship V 2-12 May be repeated for credit; cumulative maximum 12 hours. By interview only. Opportunity in an educational, industrial, municipal or private sports or recreational setting; direct participation in tasks, research and reporting activities.

596 Seminar V 1-2 May be repeated for credit.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

NURS

581 Advanced Pathophysiology 4 Prereq graduate standing in nursing or permission of instructor. Advanced cellular and system pathophysiology of individuals with neurological, endocrine, immune, hematolgoy, cardiopulmonary, renal, gastrointestinal, bone and skin disorders.

Family Nurse Practitioner - Cert in Family Nurse Practition

Degree offered: Graduate Certificate in Family Nurse Practitioner

Faculty working with graduate students: 57

Graduate students: 10

Graduate students receiving assistantships or scholarships: 40%

Program offered: Spokane, Tri-Cities, Vancouver

Tests required: TOEFL, TOEFLI

Deadline: Fall: February 1
Spring: October 1

Requirements

A personalized program of study is developed at the time of acceptance into the program. Certificate requirements are individualized based on prior MN education. At this point, only prior WSU credits meet the requirements of this certificate program.

Program Description

The MN degree program prepares advanced-practice nurses with leadership skills to plan, implement, coordinate and evaluate health care, as well as formulate policy for a diverse and multi-cultural society. It also prepares advanced-practice nurses to work with health care providers and those in other occupations to plan and provide high quality care. A post-masters program is also available for nurse practitioner students.

Degree Description

The masters program is described in the WSU on-line annual catalog. Students with a masters degree in nursing with specialization in another field are eligible for review to complete courses specific to the Family Nurse Practitioner program and receive a certificate of completion.

Training and Professional Development Opportunities

Some opportunities exist for: teaching assistantships, research assistantships, clinical internships and international medical work.

Post-Graduate Employment Opportunities

Family nurse practitioner positions

Post-Graduate Career Placements

FNP positions in such places as clinics, offices, hospitals, rural and urban areas.

Contact Information

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Faculty

Carol Allen, Merry Armstrong, Jacquelyn Banasik, Celestina Barbosa-Leiker, Mary Bayne, Sandra Benavides-Vaello, Ruth Bindler, Debra Brinker, Margaret Bruya, Patricia Butterfield, Joan Caley, Rebecca Cardell, Sandy Carollo, Cynthia Corbett, Neva Crogan-Pomilla, Kenn Daratha, Julie Dewitt-Kamada, Joann Dotson, Dawn Doutrich, Alice Dupler, Linda Eddy, Phyllis Eide, Roberta Emerson, Cynthia Fitzgerald, Virginia Guido, Melvin Haberman, Laura Hahn, Anne Hirsch, Stephen Hirsch, Renee Hoeksel, Shigeko Izumi, Margaret Jones, Suzan Kardong-Edgren, Janet Katz, Sarah Kooienga, Janet Lohan, Naomi Lungstrom, Anne Mason, Randi Obrien, Tamara Odom-Maryon, Julie Postma, Janet Purath, Melody Rasmor, John Roll, Dawn Rondeau, Allan Sanders, Lorna Schumann, Billie Severtsen, Michele Shaw, Kawkab Shishani, Robert Short, Denise Smart, Mary Sobralske, Janet Spuck, Ryan Townsend, Catherine Van Son and Roxanne Vandermause.

NURS

503 **Scientific Inquiry in Nursing** 2 Prereq graduate standing in nursing or permission of the instructor. Scientific inquiry applied to theoretical and philosophical foundations in nursing.

504 **Methods of Nursing Research** 3 Prereq Nurs 503 or c//. Research process as foundational to both conduct of scientific inquiry and utilization of findings.

507 **Health Care Policy Analysis** V 2-3 Prereq graduate standing. Analysis of health care system policy; exploration of issues of clinical management and community resource utilization including advocacy techniques.

562 **Advanced Health Assessment and Differential Diagnoses** 4 (3-3) Prereq graduate standing in nursing. Advanced holistic health assessment/differential diagnosis; analysis of data from biological, sociological, psychological, cultural, and spiritual dimensions.

563 **Advanced Pharmacological Concepts and Practice** 4 (3-3) Prereq graduate standing in nursing. Pharmacology for clinical practice including decision making, prescribing, drug monitoring, and patient education associated with prescriptive authority.

567 **Primary Care of Families: Adults and Elders** 4 (1-9) Prereq admission to FNP program; Nurs 562; Nurs 563; Nurs 581. Assessment, differential diagnosis, therapeutic intervention with adults; developmental changes; opportunities to provide diagnostic, maintenance, and follow-up care.

568 **Primary Care of Families: Infants, Children and Adolescents** 4 (1-9) Prereq admission to FNP program; Nurs 562; Nurs 563; Nurs 581. Assessment, differential diagnosis, and therapeutic intervention with infants, children, and adolescents in rural and urban settings.

569 **Primary Care of Families: Family** 4 (1-9) Prereq admission to FNP program; Nurs 562; Nurs 563; Nurs 581. Assessment, differential diagnosis, therapeutic intervention with individuals in childbearing, childrearing, and multigenerational families.

570 **Clinical Decision Making** 1 (0-3) Prereq Nurs 581, 562, 563; concurrent with first clinical course. Provides a framework for systematic collection, organization, interpretation, and communication of data for the development of differential diagnosis.

575 **Diagnostic Testing and Interpretation** 3 (2-3) Prereq admission to FNP program. Analysis of diagnostic findings across the age continuum for clinical decision making; selected diagnostic and treatment skills for advanced practice.

581 **Advanced Pathophysiology** 4 Prereq graduate standing in nursing or permission of instructor. Advanced cellular and system pathophysiology of individuals with neurological, endocrine, immune, hematolgoy, cardiopulmonary, renal, gastrointestinal, bone and skin disorders.

595 **Internship** V 1 (0-3) to 10 (0-30) May be repeated for credit; cumulative maximum 10 hours. Prereq admission to FNP program; Nurs 562; Nurs 563; Nurs 581; one of Nurs 567, 568, 569, 571, or 572. Application and integration of theoretical content, research findings, and assessment and intervention strategies into primary care practice.

597 **Advanced Topics in Nursing** V 1-3 May be repeated for credit; cumulative maximum 6 hours.

598 **Advanced Topics in Nursing** V 1-3 May be repeated for credit; cumulative maximum 6 hours. May be repeated for credit; cumulative maximum 6 hours.

Fine Arts

Degree offered: Master of Fine Arts

Faculty working with graduate students: 12

Graduate students: 14

Graduate students receiving assistantships or scholarships: 100%

Tests required: TOEFL

Deadline: Fall: January 15
Spring: July 1

Program Description

The Fine Arts Department offers a master's program for those wishing to pursue a career in studio art. This is an interdisciplinary program where artists may focus in, but are not limited to, ceramics, drawing, digital media, painting, photography, printmaking and and sculpture. Emphasis is placed on personal and conceptual artistic development. The MFA degree serves as the entry credential to college-level teaching and/or work as a practicing artist in the fine and applied arts.

Degree Description

The department offers an interdisciplinary program where students may focus in, but are not limited to, ceramics, drawing, digital media, painting, photography, printmaking, and sculpture. Emphasis is placed on personal and conceptual artistic development in light of contemporary art practices. Graduates meet with faculty for one-on-one studio discussions. First year students have an exhibition in the departmental gallery and the second year program culminates in a thesis exhibition held in the Museum of Art. A final oral examination is also required. The degrees requires 24-30 credit hours in a major emphasis, 6-9 credit hours in a relative minor, 6 credit hours in seminar and special problems, 4 credit hours in Art History and 12 credit hours of Thesis (MFA exhibition and written thesis.)

Training and Professional Development Opportunities

Training and Professional Development Opportunities;-Opportunities are available for students to work in a professional museum context and learn to install exhibitions, give tours etc.-Our galleries in Fine Arts also enhance.-Endowed Visiting Artist program enables students to work one on one with professional artists in the field. These artists give critical feedback to our students in the form of studio visits.

Post-Graduate Employment Opportunities

Post Graduate Emplyment Opportunities;-Teaching at the college/university level.-Professional Artist-Curatorial/Gallery work.

Post-Graduate Career Placements

Post -Grad Career Placement; WSU Museum of Art,Teaching Middleton, TexasAdjunct Teaching at WSU and Tri Cities,Teaching at Missouri State University-Teaching at Green River Community CollegeTeaching at Black Hills State College and Nevada State CollegeAdjunct Professor of Art, Prince George's Community College in MD

Contact Information

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Faculty

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Fine Arts

F A

500 **Graduate Art History** 2 May be repeated for credit; cumulative maximum 6 hours. Prereq 9 hours undergraduate art history.

510 **Graduate Drawing** 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

511 **Graduate Drawing** 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

512 **Graduate Drawing** 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

520 **Graduate Painting** 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

521 **Graduate Painting** 3 (0-6) May be repeated for credit; cumulative maximum 9 hours. May be repeated for credit; cumulative maximum 9 hours.

522 **Graduate Painting** 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

530 **Graduate Digital Media** 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

531 **Graduate Digital Media** 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

532 **Graduate Digital Media** 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

540 **Graduate Ceramics** 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

541 **Graduate Ceramics** 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

542 **Graduate Ceramics** 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

550 **Graduate Sculpture** 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

551 **Graduate Sculpture** 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

552 **Graduate Sculpture** 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

570 **Graduate Printmaking** 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

571 **Graduate Printmaking** 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

572 **Graduate Printmaking** 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

580 **Graduate Photography** 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

581 **Graduate Photography** 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

582 **Graduate Photography** 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

598 **Graduate Seminar** 2 May be repeated for credit; cumulative maximum 6 hours. Topics in contemporary issues, theory, and criticism.

600 **Special Projects or Independent Study** V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 **Master's Research, Thesis, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

Food Science

Degree offered: Doctor of Philosophy (Food Science)

Faculty working with graduate students: 22

Graduate students: 18

Graduate students receiving assistantships or scholarships: 88%

Tests required: GRE (Combined), TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

Complete courses in food chemistry, food microbiology, food processing, advanced food science, seminars, statistics, research, and college teaching course. Present research proposal, complete teaching requirements in food science courses, and pass written and oral preliminary examination.

Program Description

The School of Food Science offers graduate programs leading to Doctoral and Masters of Food Science degrees. Washington State University (WSU) and University of Idaho (UI) merged faculty and programs to become the School of Food Science (SFS). This is the first program in the nation to share teaching, research, extension programs, faculty, and resources between two states and two universities. Food Science is a multidisciplinary science that applies biology, chemistry, physics, engineering, nutrition, and other sciences to improve the safety and quality of food products; develop new food products; and design new, safer, and more energy efficient food preservation methods.

Degree Description

The School of Food Science offers graduate programs leading to Doctoral and Masters of Food Science degrees. Washington State University (WSU) and University of Idaho (UI) merged faculty and programs to become the School of Food Science (SFS). This is the first program in the nation to share teaching, research, extension programs, faculty, and resources between two states and two universities. Food Science is a multidisciplinary science that applies biology, chemistry, physics, engineering, nutrition, and other sciences to improve the safety and quality of food products; develop new food products; and design new, safer, and more energy efficient food preservation methods. Curriculum emphasizes courses in food processing, food chemistry, food microbiology, sensory evaluation, and other specialized areas. Examples include the processing and manufacturing of cereal, dairy, fruit, and vegetable products; including cheeses, wines, and potatoes. Departmental faculty and adjunct/affiliate faculty may all serve as student advisors. Faculty are housed at

WSU and UI campuses, the WSU Tri-Cities campus, and the research station in Prosser, WA. Each student's program of study is individualized based on their research interests, prior academic experience, and collaboration with their major advisor.

Training and Professional Development Opportunities

Students gain research experience and leadership skills at the SFS facilities housed on the WSU and UI campuses that includes: research level chemistry, microbiology, and engineering laboratories; the WSU Creamery where on-going research on ice cream and cheese occurs, including the world renowned 'Cougar Gold' cheese; a contemporary sensory evaluation facility where aroma, flavor and taste panels are conducted, and a processing pilot plant where small-scale equipment allows for applied research. Off-campus facilities include the Food Technology Center in Caldwell, ID., and the Irrigated Agriculture Research and Extension Center (IAREC) in Prosser, WA., in the heart of the Northwest's expanding wine and food processing industries.

Post-Graduate Employment Opportunities

Food science graduates begin careers in food research and development, food quality assurance, food safety microbiology, production management, regulatory affairs, or research in the food/allied industries or federal/state regulatory agencies.

Post-Graduate Career Placements

Food scientist, research and development scientist, food safety researcher, product and process development scientist, faculty, postdoctoral research associate, director of research, development, and technical support for large companies such as Conagra, SunOpta Fruit Group, Sorrento Lactalis, Cadbury Adams, Kraft, Continental Mills, Caravan's, PepsiCo, Safeway, Danisco, Whirlpool.

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Faculty

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Food Science

FS

303 **Food Processing** 3 (2-3) Prereq Chem 345; FS 110; FS 220; rec MBioS 305; MBioS 306. Specialized techniques, concepts and practices of food processing. Field trip required.

304 **Cereal Products** 2 Prereq Chem 345. Technical principles related to the production and commercial processing of legume and cereal foods. Field trip required.

416 **Food Microbiology** 3 Prereq MBioS 305; MBioS 306. Purpose for enumeration, detection and identification of microorganisms in food products; physical, chemical and environmental factors influencing growth and survival of foodborne microorganisms; pathogenic and spoilage microorganisms in food and their control.

417 **Food Microbiology Laboratory** 2 (0-6) Prereq c// in FS 416. Methods for enumeration, detection, and identification of spoilage and pathogenic microorganisms in foods.

432 **Food Engineering** 3 Prereq FS 303. Food engineering for improving the efficiency of food processing operations and quality processed food; heat transfer, stream, air-vapor mixtures, refrigeration and fluid flow.

433 **Food Engineering Lab** 1 (0-3) Prereq FS 432 or c//. To enhance the learning experience of the students taking FS 432 through laboratories, problem sessions and group discussions.

460 **Food Chemistry** 3 Prereq Chem 345; MBioS 303. Fundamentals of food chemistry; composition of foods and the changes that occur during processing.

461 **Food Chemistry Laboratory** 1 (0-3) Prereq FS 460 or c//. Experiments related to the properties, reactions and interactions of chemical components of foods.

489 **Food Product Development** 3 (1-6) Prereq FS 303; FS 416; FS 460; senior standing. Course serves as a capstone experience for food science seniors, and will require the application of food chemistry, food processing/engineering, and microbiology course knowledge in formulating a new food product.

501 **Topics in Food Science** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Selected topics in food science.

506 **Evaluation of Dairy Products I** 1 Graduate-level counterpart of FS 406; additional requirements. Credit not granted for both FS 406 and 506.

507 **Evaluation of Dairy Products II** 1 (0-3) Graduate-level counterpart of FS 407; additional requirements. Credit not granted for both FS 407 and 507.

510 **Functional Foods and Health** 3 Prereq MBioS 303 and one year of biology. Benefits of foods beyond basic nutrition; bioactive compounds in functional foods and nutraceuticals relating to disease prevention and health promotion.

511 **Food Lipids** 3 Rec biochemistry, food chemistry. Occurrence, structure, chemical and physical properties; functions of lipids in foods.

512 **Food Proteins and Enzymes** 2 Prereq biochemistry, food chemistry. Chemistry/biochemistry of proteins/enzymes applied to food research and industry; protein functionality/enzyme technology application to food industry.

513 **Food Carbohydrates** 3 Structure function relationships of polysaccharides within food systems as a function of their respective molecular structures and physical characteristics.

516 **Food Laws** 2 Prereq senior or graduate standing. Become familiar with government statutes and regulations that contribute to a safe, nutritious, and wholesome food supply. Understand more about the law and the US legal system relevant to the regulation of the manufacture and sale of food and supplements, including jurisdictional issues, administrative law, and tort, contract, corporate, environmental, labor, and criminal law issues.

517 **Seminar Written** 2 May be repeated for credit. Planning, writing, reporting, reviewing and evaluating current food-related research.

518 **Seminar Oral** 1 May be repeated for credit. Development of skills and communication tools and techniques for oral presentations of current food science research.

522 **Sensory Evaluation of Food and Wine** 3 Prereq Stat 212; FS 110 or V E 113; or by permission. Graduate-level counterpart of FS 422; additional requirements. Credit not granted for both FS 422 and 522.

529 **Dairy Products** 3 Prereq MBioS 101 or 301; Chem 345; MBioS 303. Graduate-level counterpart of FS 429; additional requirements. Credit not granted for both FS 429 and 529.

530 **Dairy Products Lab** 1 (0-3) Prereq c// FS 529. Graduate-level counterpart of FS 430; additional requirements. Credit not granted for both FS 430 and 530.

564 **Food Toxicology** 3 Prereq MBioS 303. Graduate-level counterpart of FS 464; additional requirements. Credit not granted for both FS 464 and 564.

565 **Wine Microbiology and Processing** 3 Prereq graduate standing. Graduate-level counterpart of FS 465; additional requirements. Credit not granted for both FS 465 and 565.

570 **Advanced Food Technology** 3 Prereq FS 416, 433 or c//. Graduate-level counterpart of FS 470; additional requirements. Credit not granted for both FS 470 and 570.

583 **Advances in Cereal Sciences and Technology** 2 Prereq food chemistry, biochemistry or organic chemistry. Chemistry and functionality of cereal grains as related to their processing and product quality.

800 **Doctoral Research, Dissertation, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

Food Science

STAT

412 **Statistical Methods in Research I** 3 Prereq Stat 212, Math 140, 171, 202, or graduate standing. Intermediate statistical methods, design and analysis of research studies: completely randomized and randomized block designs, multiple regression, categorical data analysis.

512 **Statistical Methods in Research II** 3 (2-2) Prereq Stat 412 or equivalent. Analysis and interpretation of designed experiments: CRD, RCBD, spit-plot and repeated measures, multiple comparisons, multiple regression modeling, validation of assumptions.

Food Science

UNIV

590 **Preparation for College Teaching** 2 Prereq graduate standing/TA appointment. Cross-discipline instructional development for graduate teaching assistants; course development teaching techniques, university policies and procedures.

Food Science

Degree offered: Master of Science in Food Science

Faculty working with graduate students: 22

Graduate students: 33

Graduate students receiving assistantships or scholarships: 84%

Tests required: GRE (Combined), TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

Complete courses in food chemistry, food microbiology, food processing, advanced food science, seminars, statistics, and research. Present thesis seminar.

Program Description

The School of Food Science offers graduate programs leading to Doctoral and Masters of Food Science degrees. Washington State University (WSU) and University of Idaho (UI) merged faculty and programs to become the School of Food Science (SFS). This is the first program in the nation to share teaching, research, extension programs, faculty, and resources between two states and two universities. Food Science is a multidisciplinary science that applies biology, chemistry, physics, engineering, nutrition, and other sciences to improve the safety and quality of food products; develop new food products; and design new, safer, and more energy efficient food preservation methods.

Degree Description

The School of Food Science offers graduate programs leading to Doctoral and Masters of Food Science degrees. Washington State University (WSU) and University of Idaho (UI) merged faculty and programs to become the School of Food Science (SFS). This is the first program in the nation to share teaching, research, extension programs, faculty, and resources between two states and two universities. Food Science is a multidisciplinary science that applies biology, chemistry, physics, engineering, nutrition, and other sciences to improve the safety and quality of food products; develop new food products; and design new, safer, and more energy efficient food preservation methods. Curriculum emphasizes courses in food processing, food chemistry, food microbiology, sensory evaluation, and other specialized areas. Examples include the processing and manufacturing of cereal, dairy, fruit, and vegetable products; including cheeses, wines, and potatoes. Departmental faculty and adjunct/affiliate faculty may all serve as student advisors. Faculty are housed at WSU and UI campuses, the WSU Tri-Cities campus, and the research station in Prosser, WA. Each student's program of study is individualized based on their research interests, prior academic experience, and collaboration with their major advisor.

Training and Professional Development Opportunities

Students gain research experience and leadership skills at the SFS facilities housed on the WSU and UI campuses that includes: research level chemistry, microbiology, and engineering laboratories; the WSU Creamery where on-going research on ice cream and cheese occurs, including the world renowned 'Cougar Gold' cheese; a contemporary sensory evaluation facility where aroma, flavor and taste panels are conducted, and a processing pilot plant where small-scale equipment allows for applied research. Off-campus facilities include the Food Technology Center in Caldwell, ID., and the Irrigated Agriculture Research and Extension Center (IAREC) in Prosser, WA., in the heart of the Northwest's expanding wine and food processing industries.

Post-Graduate Employment Opportunities

Food science graduates begin careers in food research and development, food quality assurance, food safety microbiology, production management, regulatory affairs, or research in the food/allied industries or federal/state regulatory agencies.

Post-Graduate Career Placements

Gallo Wines, ConAgra Foods, Givaudan Flavors, Leprino Foods, Heinz Foods USA, TIC Gums, General Mills, Safeway, McCain Foods USA, Bolthouse Farms, Michelson Laboratories, Ecolab, Weichuan USA, Schwann's, Darigold, Wilcox Farms, Ventura Food, Trident Seafoods, Disney Consumer Products, Idaho Pacific Corp., Nestle Nutrition, Heinz North America, Cargill, and J.R. Simplot. Attend University for Ph.D.degree.

Contact Information

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Faculty

Byung-Kee Baik, Carolyn Bohach, Jeffri Bohlscheid, Boon Chew, Jeffry Culbertson, Richard Dougherty, Charles Edwards, James Harbertson, Thomas Henick-Kling, Kerry Huber, Karen Killinger, Scott Minnich, Greg Moller, Craig Morris, Caleb Nindo, Andrzej Paszczynski, Joseph Powers, Barbara Rasco, Carolyn Ross, Denise Smith, Barry Swanson and Gulhan Unlu.

Food Science

FS

303 **Food Processing** 3 (2-3) Prereq Chem 345; FS 110; FS 220; rec MBioS 305; MBioS 306. Specialized techniques, concepts and practices of food processing. Field trip required.

304 Cereal Products 2 Prereq Chem 345. Technical principles related to the production and commercial processing of legume and cereal foods. Field trip required.

416 Food Microbiology 3 Prereq MBioS 305; MBioS 306. Purpose for enumeration, detection and identification of microorganisms in food products; physical, chemical and environmental factors influencing growth and survival of foodborne microorganisms; pathogenic and spoilage microorganisms in food and their control.

417 Food Microbiology Laboratory 2 (0-6) Prereq c// in FS 416. Methods for enumeration, detection, and identification of spoilage and pathogenic microorganisms in foods.

432 Food Engineering 3 Prereq FS 303. Food engineering for improving the efficiency of food processing operations and quality processed food; heat transfer, stream, air-vapor mixtures, refrigeration and fluid flow.

433 Food Engineering Lab 1 (0-3) Prereq FS 432 or c//. To enhance the learning experience of the students taking FS 432 through laboratories, problem sessions and group discussions.

460 Food Chemistry 3 Prereq Chem 345; MBioS 303. Fundamentals of food chemistry; composition of foods and the changes that occur during processing.

461 Food Chemistry Laboratory 1 (0-3) Prereq FS 460 or c//. Experiments related to the properties, reactions and interactions of chemical components of foods.

489 Food Product Development 3 (1-6) Prereq FS 303; FS 416; FS 460; senior standing. Course serves as a capstone experience for food science seniors, and will require the application of food chemistry, food processing/engineering, and microbiology course knowledge in formulating a new food product.

501 Topics in Food Science V 1-3 May be repeated for credit; cumulative maximum 6 hours. Selected topics in food science.

506 Evaluation of Dairy Products I 1 Graduate-level counterpart of FS 406; additional requirements. Credit not granted for both FS 406 and 506.

507 Evaluation of Dairy Products II 1 (0-3) Graduate-level counterpart of FS 407; additional requirements. Credit not granted for both FS 407 and 507.

510 Functional Foods and Health 3 Prereq MBioS 303 and one year of biology. Benefits of foods beyond basic nutrition; bioactive compounds in functional foods and nutraceuticals relating to disease prevention and health promotion.

511 Food Lipids 3 Rec biochemistry, food chemistry. Occurrence, structure, chemical and physical properties; functions of lipids in foods.

512 Food Proteins and Enzymes 2 Prereq biochemistry, food chemistry. Chemistry/biochemistry of proteins/enzymes applied to food research and industry; protein functionality/enzyme technology application to food industry.

513 Food Carbohydrates 3 Structure function relationships of polysaccharides within food systems as a function of their respective molecular structures and physical characteristics.

516 Food Laws 2 Prereq senior or graduate standing. Become familiar with government statutes and regulations that contribute to a safe, nutritious, and wholesome food supply. Understand more about the law and the US legal system relevant to the regulation of the manufacture and sale of food and supplements, including jurisdictional issues, administrative law, and tort, contract, corporate, environmental, labor, and criminal law issues.

517 Seminar Written 2 May be repeated for credit. Planning, writing, reporting, reviewing and evaluating current food-related research.

518 Seminar Oral 1 May be repeated for credit. Development of skills and communication tools and techniques for oral presentations of current food science research.

522 Sensory Evaluation of Food and Wine 3 Prereq Stat 212; FS 110 or V E 113; or by permission. Graduate-level counterpart of FS 422; additional requirements. Credit not granted for both FS 422 and 522.

529 Dairy Products 3 Prereq MBioS 101 or 301; Chem 345; MBioS 303. Graduate-level counterpart of FS 429; additional requirements. Credit not granted for both FS 429 and 529.

530 Dairy Products Lab 1 (0-3) Prereq c// FS 529. Graduate-level counterpart of FS 430; additional requirements. Credit not granted for both FS 430 and 530.

564 Food Toxicology 3 Prereq MBioS 303. Graduate-level counterpart of FS 464; additional requirements. Credit not granted for both FS 464 and 564.

565 Wine Microbiology and Processing 3 Prereq graduate standing. Graduate-level counterpart of FS 465; additional requirements. Credit not granted for both FS 465 and 565.

570 Advanced Food Technology 3 Prereq FS 416, 433 or c//. Graduate-level counterpart of FS 470; additional requirements. Credit not granted for both FS 470 and 570.

583 Advances in Cereal Sciences and Technology 2 Prereq food chemistry, biochemistry or organic chemistry. Chemistry and functionality of cereal grains as related to their processing and product quality.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Food Science

STAT

412 Statistical Methods in Research I 3 Prereq Stat 212, Math 140, 171, 202, or graduate standing. Intermediate statistical methods, design and analysis of research studies: completely randomized and randomized block designs, multiple regression, categorical data analysis.

Foreign Languages and Cultures

Degree offered: Master of Arts in Foreign Languages and Cultures

Faculty working with graduate students: 7

Graduate students: 12

Graduate students receiving assistantships or scholarships: 100%

Tests required: TOEFL

Deadline: Fall: February 1
Spring: N/A

Program Description

The Department of Foreign Languages and Cultures offers a Masters program in Foreign Languages, with an emphasis in Spanish. The emphasis of the program is on Spanish (Peninsular) and Latin American literature, film and culture, but seminars on foreign language pedagogy and practical teaching experience are provided. Applicants should have majors in related areas, such as literature, linguistics, and pedagogy, but applicants from other humanities and social sciences disciplines will be considered on a case by case basis, as long as they have an advanced proficiency level in all Spanish-language skills, and a solid foundation and understanding of culture.

Degree Description

The Department of Foreign Languages and Cultures offers a Masters program in Foreign Languages, with an emphasis in Spanish. The emphasis of the program is on Spanish (Peninsular) and Latin American literature, film and culture, but seminars on foreign language pedagogy and practical teaching experience are provided. Applicants should have majors in related areas, such as literature, linguistics, and pedagogy, but applicants from other humanities and social sciences disciplines will be considered on a case by case basis, as long as they have an advanced proficiency level in all Spanish-language skills, and a solid foundation and understanding of culture.

Training and Professional Development Opportunities

Summer internships and/or teaching positions.

Contact Information

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Foreign Languages & Cultures
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Ana Maria Rodriguez-Vivaldi
Associate Professor
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Cynthia Davis
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Foreign Languages & Cultures
110 Thompson Hall
Washington State University
Pullman, WA 99164-2610
Telephone: 509 335-4135
Fax: 509 335-3708
E-mail: daviscm@wsu.edu

Faculty

Eloy Gonzalez, Michael Hubert, Francisco Manzo-Robledo, Vilma Navarro-Daniels, Maria Previto, Ana Rodriguez-Vivaldi and Inigo Serna.

FOR L

540 Research and Methods of Teaching Foreign Languages 3 Prereq graduate standing. Graduate level counterpart of For L 440; additional requirements. Credit not granted for both For L 440 and 540.

560 Seminar in Scholarly Methodology 2 Prereq graduate standing. Bibliography and formal aspects of scholarly writing; general introduction to literary criticism.

SPAN

550 Medieval Literature 3 Prereq graduate standing or permission of instructor. Selected works. Taught in Spanish.

551 Seminar in Golden Age Literature 3 Prereq graduate standing or permission of instructor. Reading and discussion of representative works of the Spanish Golden Age. Taught in Spanish.

552 Topics in Nineteenth-Century Spanish Literature 3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing or permission of instructor. Selected works and topics. Taught in Spanish.

553 Topics in Twentieth-Century Spanish Literature 3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing or permission of instructor. Selected works and topics. Taught in Spanish.

555 Seminar in Colonial Spanish American Literature 3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing or permission of instructor. Seminar on conquest and colonial literature in Hispanic America.

556 Seminar in Nineteenth-Century Spanish American Literature 3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing or permission of instructor. Study of nineteenth-century Spanish American Literature. May be releated for credit; cumulative maximum 6 hours.

557 Seminar in Twentieth-Century Spanish American Literature 3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing or permission of instructor. Study of twentieth-century Spanish American literature and culture.

560 Beginning Instructional Practicum 2 May be repeated for credit; cumulative maximum 4 hours. Prereq graduate standing or permission of instructor. An introduction to foreign language instruction for beginning teaching assistants.

561 Advanced Instructional Practicum 1 May be repeated for credit; cumulative maximum 4 hours. Prereq graduate standing or permission of instructor. Supervised practical experience in foreign language teaching.

Foreign Languages and Cultures

Degree offered: Master of Arts in Foreign Languages and Cultures - Non Thesis

Faculty working with graduate students: 7

Graduate students: 12

Graduate students receiving assistantships or scholarships: 100%

Tests required: TOEFL, TOEFLI

Deadline: Fall: February 1
Spring: N/A

Program Description

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Faculty

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553 Topics in Twentieth-Century Spanish Literature 3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing or permission of instructor. Selected works and topics. Taught in Spanish.

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556 Seminar in Nineteenth-Century Spanish American Literature 3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing or permission of instructor. Study of nineteenth-century Spanish American Literature. May be releated for credit; cumulative maximum 6 hours.

557 Seminar in Twentieth-Century Spanish American Literature 3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing or permission of instructor. Study of twentieth-century Spanish American literature and culture.

560 Beginning Instructional Practicum 2 May be repeated for credit; cumulative maximum 4 hours. Prereq graduate standing or permission of instructor. An introduction to foreign language instruction for beginning teaching assistants.

561 Advanced Instructional Practicum 1 May be repeated for credit; cumulative maximum 4 hours. Prereq graduate standing or permission of instructor. Supervised practical experience in foreign language teaching.

General Engineering Management - Cert in General Eng Mgt

Degree offered: Graduate Certificate in General Engineering Management

Graduate students: 15

Program offered: DDP

Deadline: Fall: November 15 (January 10 international)
Spring: July 15 (July 1 international)
Summer: April 1 (Default international)

Requirements

Student must apply for graduation for the certificate in the final semester according to graduate school deadlines.

Program Description

The ETM Certificate Program allows students to complete shorter professional blocks of coursework relevant to their specific needs. Rather than completing all the course requirements for an ETM master's degree, students may take four courses (12-credit hours) in specialized areas. A certificate is awarded upon completion of these courses. Course credits earned for a certificate may also apply to a master's degree in the ETM Program or other graduate degree programs. A student may earn more than one certificate and may work on the certificate and master's program concurrently. Eight certificates are available in the Master of Engineering and Technology Management degree program.

Degree Description

Students whose graduate studies include the management of organizations, finances, optimization, projects, statistics and strategy have covered the breadth of the basic core topics needed for Engineering & Technology Managements. The General Management Certificate acknowledges a partial achievement of that goal Students who complete a course in the management of organizations and three of the other five specific courses can receive a certificate in General Management.

Training and Professional Development Opportunities

It takes special skills to manage complex processes. The General Management Certificate recognizes the development of part of these skills without requiring the full masters degree. The General Management Certificate shows the student has make significant progress towards a masters degree and can differentiate the student from others not in graduate program. This certificate is recognized by many companies, large and small, as significant post graduate studies. It is frequently reported as helping to advance a career in Engineering & Technology Management.This certificate is the most popular Graduate Certificate in the Engineering & Technology Program. Students in technical business, finance, engineering disciplines, computer science, biology, food science, mathematics and production management find this certificate a valuable addition to their resume.

Contact Information

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Program Support Supervisor
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WSU
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Fax: 509-335-7290
E-mail: pelshafei@wsu.edu

Engineering Management

E M

501 Management of Organizations 3 Exploration of issues related to individual behavior in work organizations, including motivation, leadership, team-building, and team management skills.

505 Finance for Technical Systems 3 Time value of money, capital budgeting, accounting principles, cost, valuation, risk, cost accounting and sensitivity analyses: concepts for engineering decision-making.

540 Operations Research for Managers 3 Applying linear, integer, goal programming; network optimization; queuing analysis; dynamic programming; simulation; Markov analysis; and forecasting to engineering management decisions.

564 Project Management 3 Planning, organizing, scheduling and controlling major projects; human dimensions, PERT and CPM scheduling models, resource allocation, and cost controls. Credit not granted for both E M 464 and 564.

591 Strategic Management of Technology and Innovations in Engineering 3 Prereq graduate standing. Management of technological innovation; integrating strategy, new product development, corporate entrepreneurship, and innovation; features action-oriented cases.

Engineering Management

STAT

430 Statistical Methods in Engineering 3 Prereq Math 172; 220. Random variables, sampling, hypothesis testing; linear, multilinear, and nonlinear regression; analysis of variance for designed experiments; statistical computing. Credit not normally granted for both Math 430 and 442.

Geology

Degree offered: Doctor of Philosophy (Geology)

Faculty working with graduate students: 8

Graduate students: 7

Graduate students receiving assistantships or scholarships: 100%

Tests required: GRE (Quantitative), GRE (Verbal), TOEFL, TOEFLI

Deadline: Fall: January 15
Spring: October 15

Requirements

Please see the program/department for more information.

Contact Information

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Faculty

Catherine Cooper, David Gaylord, Chester Keller, Peter Larson, Dirk Schulze-Makuch, Jeffrey Vervoort, Anthony Watkinson and John Wolff.

GEOL

505 Geophysics 4 (3-3) Prereq Geol 340. Graduate-level counterpart of Geol 405; additional requirements. Credit not granted for both Geol 405 and 505.

506 Basin Analysis 3 Graduate-level counterpart of Geol 406; additional requirements. Credit not granted for both Geol 406 and 506.

508 Environmental Spatial Statistics 3 (2-2) Prereq Stat 412. Same as SoilS 508.

518 Geomicrobiology 3 The role of microorganisms in the formation and dissolution of rocks and minerals; microbial processes in ground and surface water environments, extreme environments and the deep subsurface; early life on Earth and the possibility of life on other planetary bodies. Two additional research assignments and an additional question on two exams required for graduate credit. Credit not granted for both Geol 418 and 518.

520 Advanced Topics in Sedimentology 3 (2-3) May be repeated for credit; cumulative maximum 6 hours. Prereq Geol 320. Modern aspects of sedimentary rocks. Field trip required.

521 Clastic Depositional Systems 3 (2-3) Prereq Geol 320. Clastic sedimentary environments; architectural elements and facies analysis. Field trip required.

523 Advanced Topics in Stratigraphy 3 May be repeated for credit. Prereq Geol 421.

525 Carbonate Depositional Systems 3 (2-3) Prereq Geol 320. Modern carbonate environments and processes; ancient carbonate rock sequences; carbonate platform-to-basin transition; diagenesis of carbonate rocks. Field trip required.

538 Orogenic Systems I 3 Prereq Geol 340. Field-base course examines tetonic processes active in the northern Cordillera. Field trip required and final research paper.

540 Tectonics 3 Prereq Geol 340. Nature and origin of the Earth's major tectonic features.

541 Structural Analysis 3 (2-3) Prereq Geol 340. Structural analysis of complexly deformed rocks in orogenic belts. Field trip required.

542 Geomechanics 3 Prereq Phys 102, Math 171. Concepts of linear elastic fracture mechanics as applied to the classification, origin and evolution of all types of rock fractures; continuum theory in rock mechanics; rock strength and failure criteria; stress tensors; elastic theory. Field trip required.

545 Astrobiology 3 Graduate-level counterpart of Geol 445; additional requirements. Credit not granted for both Geol 445 and 545.

546 Fault Mechanics 3 Prereq Geol 340. Examination of fundamental concepts of fault mechanics, including brittle failure, rock friction, fluid pressure effects, and variable rheological behaviors; examination of internal fault architectures to distinguish fault zone styles; stress, strain, and displacement fields addressed from a theoretical perspective and the application of geodetic measurement techniques and secondary structure analyses; emphasis on interpretation of fault slip distributions and relationship to rock properties, fault shape, and mechanical interaction in echelon fault systems; such insights placed in context of 3-D fault systems geometric evolution as well as earthquake behavior and seismic hazard recognition. One weekend field trip.

550 Advanced Mineralogy 3 Prereq Chem 106, Geol 355. Elements of crystal chemistry and crystal physics.

552 X-ray Analysis in Geology 3 (2-3) Generation and use of X-rays for geological research; electron microprobe/SEM, X-ray fluorescence and X-ray powder diffraction.

554 Physical Petrology 3 Prereq Geol 356. Applications of continuum mechanics and fluid dynamics to generation, rise, storage, and eruption of magmas.

560 Advanced Igneous Petrology 3 (2-3) Origin, evolution, and tectonic significance of igneous rocks. Field trip required.

562 Watershed Biogeochemistry 3 Prereq general chemistry. Sources, transformations, fates and impacts of biogeochemically important compounds as they move downstream through watersheds to the coastal zone.

567 Volcanology 3 (2-3) Prereq Geol 356. Graduate-level counterpart of Geol 467; additional requirements. Credit not granted for both Geol 467 and 567.

578 Groundwater Geobiology 3 (2-3) Prereq graduate standing. Interaction of groundwater geology and the environment including microbial populations with emphasis on microbial transport in the sub-surface and bioremediation approaches.

579 Groundwater Geochemistry V 2-4 May be repeated for credit; cumulative maximum 4 hours. Prereq Chem 331, Geol 475. Organic and inorganic aqueous geochemistry; controls on groundwater contaminant fate.

583 Radiogenic Isotopes and Geochronology 3 Prereq graduate standing. Radiogenic isotopes and their uses as chronometers (radiometric dating) and as tracers of earth evolution and differentiation.

584 Stable Isotope Geochemistry 3 Principles and applications of isotope geochemistry in the geological sciences.

588 Methods in Radiogenic Isotope Geochemistry 3 (1-6) Prereq Geol 480: Geol 583. Laboratory-based course in modern analytical methods in radiogenic isotope geochemistry.

595 Advanced Topics in Geology V 1-4 May be repeated for credit; cumulative maximum 6 hours. Topics of current interest in geology.

596 Advanced Topics in Geology V 1-4 May be repeated for credit; cumulative maximum 6 hours. Topics of current interest in geology.

597 Advanced Topics in Geology V 1-4 May be repeated for credit; cumulative maximum 6 hours. Topics of current interest in geology.

598 Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Prereq major in Geol or related field. Graduate-level counterpart of Geol 498; additional requirements. Credit not granted for both Geol 498 and 598.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Geology

Degree offered: Master of Science in Geology

Faculty working with graduate students: 8

Graduate students: 21

Graduate students receiving assistantships or scholarships: 100%

Tests required: GRE (Quantitative), GRE (Verbal), TOEFL, TOEFLI

Deadline: Fall: January 15
Spring: October 15

Requirements

Please see the program/department for more information.

Contact Information

David Gaylord
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Faculty

Catherine Cooper, David Gaylord, Chester Keller, Peter Larson, Dirk Schulze-Makuch, Jeffrey Vervoort, Anthony Watkinson and John Wolff.

Geology

Degree offered: Master of Science in Geology - Non Thesis

Faculty working with graduate students: 8

Tests required: GRE (Quantitative), GRE (Verbal), TOEFL, TOEFLI

Deadline: Fall: January 15
Spring: October 15

Requirements

Please see the program/department for more information.

Contact Information

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Faculty

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Global Justice and Security Studies - Cert in Glob Jus and Sec Studies

Degree offered: Graduate Certificate in Global Justice and Security Studies

Faculty working with graduate students: 7

Graduate students: 6

Deadline: Fall: January 10
Spring: July 1

Program Description

This terminal degree program is designed to provide students with a specialized qualification better suited for the pursuit of professional careers in federal, state, or local government. The GJSS program targets students intending to pursue largely non-academic, governmental careers as practitioners, whether it be in the field of homeland security, law enforcement, or as analysts within the U.S. intelligence or defense communities.

Degree Description

MA degree including the Graduate Certificate in Global and Security Studies

Training and Professional Development Opportunities

None at WSU

Post-Graduate Employment Opportunities

The GJSS program targets students intending to pursue largely non-academic, governmental careers as practitioners, whether it be in the field of homeland security, law enforcement, military service, or as analysts within the U.S. foreign, intelligence,or defense communities.

Post-Graduate Career Placements

Many have gone on to careers in US government agencies, the military, or decided to pursue doctoral studies.

Contact Information

Dr. Thomas Preston

Dr. Martha Cottam

Faculty

David Brody, Martha Cottam, Faith Lutze, Otwin Marenin, John Preston, Steven Stehr and Bryan Vila.

CRM J

505 **Comparative Criminal Justice** 3 Comparative study of crime laws and criminal justice systems in selected foreign countries.

530 **Criminal Justice: Process and Institutions** 3 Processes of criminal justice in the context of the social, political, and economic environments.

570 **The Police and Society** 3 Community and selected social institutional factors as related to their influence on police systems.

572 **Seminar in Comparative Policing** 3 Study of the history, organization, and policies of policing systems in selected countries and of transnational policing.

591 **Seminar in the Administration of Criminal Justice** 3 May be repeated for credit; cumulative maximum 6 hours. Current issues, problems, and critical concerns within the field of administration of criminal justice.

592 **Proseminar in Administration, Justice, and Applied Policy Studies** 3 May be repeated for credit; cumulative maximum 6 hours. Same as Pol S 542.

600 **Special Projects or Independent Study** V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 **Master's Research, Thesis, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 **Doctoral Research, Dissertation, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

POL S

400 **Political Science Issues** 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Pol S 101. Current issues in political science.

424 **US National Security Policy** 3 Prereq Pol S 103. Substantive and theoretical research on issues relevant to formulation and requirements of post-Cold War, US national security and defense policy.

427 **United States Foreign Relations** 3 Ends and means in foreign policy; organization, management, control, and current policy issues.

428 **Issues in Political Psychology** 3 Prereq Pol S 101 or Psych 105; completion of one Tier I and three Tier II courses. Introduction to the ways in which psychological factors influence political phenomena.

429 **Special Topics in American Foreign and Defense Policy** 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Pol S 102 or 103. Current issues in foreign policy.

503 **Research Methods in Political Science and Criminal Justice** 3 Prereq 12 hours Pol S; Soc 321. Social science research design topics, measurement, sampling, data sources, experimental and quasi-experimental designs, field and historical designs, content analytic designs.

514 **Seminar in Public Policy** 3 Examination of central questions in public policy including the nature of public policy, policy analysis, and government intervention in society.

530 **American Foreign Policy: Theories and Applications** 3 Theories of international politics applied to American foreign policy.

531 **Seminar in International Security** 3 International security and arms control politics, negotiations, agreements.

533 **Topics in Political Psychology** 3 May be repeated for credit; cumulative maximum 6 hours. Psychological influences on political decision making, bargaining, conflict and conflict resolution options.

540 **Proseminar in Public Administration** 3 Proseminar over viewing basic theories of administrative organization, relationships, and behavior.

600 **Special Projects or Independent Study** V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 **Master's Research, Thesis, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 **Master's Special Problems, Directed Study, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 **Doctoral Research, Dissertation, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

Health Policy and Administration

Degree offered: Master of Health Policy and Administration

Faculty working with graduate students: 13

Graduate students: 24

Graduate students receiving assistantships or scholarships: 16%

Program offered: Spokane

Tests required: GMAT, GRE (Combined), IELTS, MELAB, TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

No work of C grade or less may be dropped from a program, nor can a course be repeated for a higher grade if the final grade is C or higher. Any course listed on the program in which a grade of C-, D, or F is earned must be repeated. Any graduate student who fails to maintain a cumulative grade point average of 3.00 or higher for all course work subsequent to admission to the Graduate School will be dropped from the University. Credits with a grade of B or higher that are awarded after a bachelor's degree and are earned in other accredited graduate schools may be transferred and applied toward a student's graduate degree program if they are also appropriate to HPA. The number of such credit hours is limited to no more than half of the total graded course credits required by the program. None of this credit may be applied toward another advanced degree.

Program Description

With CAHME accreditation, renowned faculty and a strong, distinguished curriculum, the HPA program offers students outstanding preparation for health policy and health management careers. What's more, our location in Spokane-a large tertiary medical center-fosters valuable connections with the medical community. The HPA Program believes that the health status of citizens is determined heavily by community and environmental characteristics, and individual behavior, in addition to the health care system. Thus, we think health care leaders and organizations should be closely linked to the community setting in which they work. The program provides significant opportunities for students to participate in community activities while learning how to undertake community health improvement. The faculty have a close working relationship with public officials and policy makers at the state level who work with health care reform issues. Students and faculty have the opportunity to work on policy projects providing rich and broadening experiences in health policy and management.

Degree Description

The core courses provide basic understanding and experience in managing

health care systems in the context of enhancing community health status. A multidisciplinary systems perspective in many courses helps students develop knowledge and skills in communication, ethics, interpersonal relations, team building, management, and delivery of cost-effective health care. The learning environment is both rigorous and flexible. Students are encouraged to design individualized programs suitable to a variety of career goals and future employment opportunities. Practical and individualized experiences, through internships, fellowships, research assistantships, and special projects build students' skills and values in varied administrative settings.

Training and Professional Development Opportunities

HPA Seminar Series, ACHE Congress, AUPHA Full Graduate Membership Status, Academy Health, American Public Health Association.

Post-Graduate Employment Opportunities

Post Graduate Fellowships, Hospitals or Health Systems, Physician Practices, Military or VA, Foundations, Long-term Care Facilities, Home Health Care Facilities, Consulting Firms, Insrance/HMOs, Doctoral Programs.

Post-Graduate Career Placements

Post Graduate Fellowships, Hospitals or Health Systems, Physician Practices, Military or VA, Foundations, Long-term Care Facilities, Home Health Care Facilities, Consulting Firms, Insrance/HMOs, Doctoral Programs.

Contact Information

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Dr. Joseph S. Coyne
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Faculty

Christopher Blodgett, Lawrence Cohen, Joseph Coyne, Joshua Engle, James Kennedy, Gerald Kobluk, Sterling McPherson, Sean Murphy, Fredrick Peterson, John Roll, Robert Short, Gary Smith and Brent Stanyer.

Health Policy And Administration

HPA

500 Introduction to the Health Care System 3 Orientation to history and organization of the health care system.

501 Health Care Policy and Politics 3 History, methods, results and evaluation of health-care-related policy and politics.

502 Law and Ethics of Health Management 3 Private health law and ethics, including professional liability, relationship of physician and patient, malpractice reform, health institutions, and health access.

503 Government Regulation of Health Services 3 Prereq graduate standing. Public law regulation; health care quality, personhood and individual autonomy, life/death decisions, antitrust, health care financing and cost control.

509 Health Care Economics 3 Prereq microeconomics. The economics of allocating, financing and delivering health care services.

510 Health Care Cost Accounting 3 Prereq basic financial accounting; graduate standing. Basic cost-accounting concepts, principles, and applications in the health care setting.

511 Health Care Finance 3 Prereq HPA 512. Aspects of health care financial management fundamentals and managerial accounting for strategic financial management.

515 Health Care Management 3 Introduction to the knowledge, skills, and values associated with the practice of health management.

516 Health Quality Management 3 Overview of the total field of health quality, including strategic quality management programs, quality assurance, quality control, and design.

517 Health Care and Human Resources Management 3 Managing human resources and health professionals in diverse health care environments such as hospitals, clinics, home health care agencies and pharmaceutical firms.

519 Biostatistics and Epidemiology for the Health Sciences 3 Prereq graduate standing. Application of quantitative methods to problems in the health sciences; statistical analysis software.

520 Research and Evaluation Methods 3 Prereq statistics or HPA 519. Basic research and evaluation methods for health care professionals.

530 Health Care Information Systems 3 Key attributes of health care information systems and their evolution in health care environment.

570 Marketing for Health Care Organizations 1 Prereq graduate standing. Basic marketing concepts, principles, and issues related to marketing public and private health care.

572 Health Care Ethics 3 Ethical issues affecting health care institutions, professionals and consumers.

573 Comparative International Health Care 3 Analysis of key attributes of health care in selected countries and comparisons with the US health care system.

574 Rural Health Care in America 3 The unique characteristics, professional opportunities, problems and reform alternatives in rural health care.

579 Mental Health Policy and Law 3 Professions regulation, negligence, consent, privacy; civil commitment, treatment rights, guardianship, trial competency, insanity defense, sex offenders, execution capacity, entitlements, discrimination.

580 Disability and Aging Policy 3 Prereq graduate standing. Policy aspects of disability, aging and chronic illness; including work disability, health and long term care, rationing, gender and class.

590 Strategic Management and Marketing 3 Prereq HPA 511, 515. Key components and processes in strategic planning.

597 Internship V 1-5 May be repeated for credit; cumulative maximum 5 hours. Prereq HPA 500. Student experience in professional work settings.

599 Special Topics in Health Policy and Administration V 1-3 May be repeated for credit; cumulative maximum 9 hours.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Health-Assistive Smart Environment Design - Cert in Hlth Asst Smrt Env Des

Degree offered: Graduate Certificate in Health-Assistive Smart Environment Design

Faculty working with graduate students: 5

Graduate students: 12

Graduate students receiving assistantships or scholarships: 100%

Requirements

Please see the program/department for more information.

Contact Information

Diane Cook
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E-mail: cook@eecs.wsu.edu

Faculty

Diane Cook, Lawrence Holder, Sankar Jayaram, Maureen Schmitter-Edgecombe and Behrooz Shirazi.

Civil Engineering

C E

504 **Sustainability Engineering I** 3 Graduate-level counterpart of C E 404; additional requirements. Credit not granted for both C E 404 and 504.

505 **Sustainability Engineering II** 3 Graduate-level counterpart of C E 405; additional requirements. Credit not granted for both C E 405 and 505.

Civil Engineering

CPT S

540 **Artificial Intelligence** 3 Graduate-level counterpart of Cpt S 440; additional requirements. Credit not granted for both Cpt S 440 and 540.

543 **Human-Computer Interaction** 3 Graduate-level counterpart of Cpt S 443; additional requirements. Credit not granted for both Cpt S 443 and 543.

570 **Machine Learning** 3 Prereq Cpt S 122; graduate standing. Introduction to building computer systems that learn from their experience; classification and regression problems; unsupervised and reinforcement learning.

580 **Advanced Topics in Computer Science** 3 May be repeated for credit.

Civil Engineering

PSYCH

508 **Special Topics in Psychology** V 1-3 May be repeated for credit.

561 **Human-Computer Interaction** 3 Overview of human-computer interaction (HCI) topics, including user models, dialog, display design, usability, software development, groupware, and multimedia.

575 **Foundations of Neuropsychology** 3 Foundations in brain/behavior relationships and neuropathological syndromes; preparation for advanced training in neuropsychological assessment.

592 **Cognition and Memory** 3 Experimental approaches to human information processing, memory, and cognition.

Higher Education - Community College Leadership

Degree offered: Doctor of Education

Faculty working with graduate students: 8

Graduate students: 7

Program offered: Pullman, Spokane, Tri-Cities, Vancouver

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal)

Deadline: Fall: January 10
Spring: July 1

Program Description

The graduate degree program in Higher Education Administration includes preparation at the master's and doctoral levels for students who plan to achieve positions of leadership in higher education administration and related fields or who wish to become faculty members. The Ph.D. in education offers specializations in higher education administration or student affairs.The Higher Education Administration Program offers five graduate degrees:â– Master of Arts (M.A.), specializing in higher education administration â– Master of Education (Ed.M.), specializing in higher education administrationâ– Doctor of Education (Ed.D.), specializing in communitycollege leadershipâ– Doctor of Education (Ed.D.), specializing in higher education administrationâ– Doctor of Philosophy (Ph.D.), specializing in higher education administrationâ– Doctor of Philosophy (Ph.D.), specializing in student affairsAs a graduate student, the College of Education's undergraduate leadership studies minor (with 100 to 150 undergraduate students) provides you with both research and teaching opportunities. In addition, other partnerships with university student affairs units provide further opportunities tied to the students' educational pursuits.Cleveland Hall is home to the George B. Brain Education Library, providing you with access to their main collection of education-related materials, a separate children's literature section, a media center, and a workroom.

Degree Description

The higher education program is dedicated to meeting students' needs as current and future leaders and faculty in colleges, universities, or in athletic programs throughout the country. The program provides a balance and integration of research, theory, policy, and practical experience. Students examine the range of historical, social, legal, political, economic, and ethical issues that impact the practice and administration of higher education. The Ed.D. is a professional degree awarded by the Department designed to prepare students whose primary interest is in the practice of education. Recognized as a professional degree, it is typically chosen by students who will occupy positions of leadership and applied specialties in public or private educational organizations or related fields. The Ed.D. with emphasis in Community College Leadership is designed to appeal to students who currently work in community colleges, or are interested in moving into administrative positions within the community college setting. The degree program has an emphasis on preparing people to move into positions of increasing leadership and responsibility in the community college sector of higher education

Post-Graduate Employment Opportunities

Faculty in higher education and student affairs programs; student affairs administrators; policy analysts; government relations; general university administrators; athletic administrators.

Post-Graduate Career Placements

Not yet available

Contact Information

Graduate Coordinator
Washington State University
Office of Graduate Studies
Cleveland Hall 252
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Pullman, WA 99164-2114
Telephone: 509-335-9195
Fax: 509-335-2097
E-mail: gradstudies@wsu.edu

Faculty

Alton Jamison, Milton Lang, Xyanthe Neider, Paul Pitre, Jason Sievers, Patricia Sturko, Kelly Ward and Christian Wuthrich.

ED AD

501 Philosophy of Education 3 Development of American educational philosophy.

503 Values and Ethics for Educational Leaders 3 Study of ethical theories, the moral dilemmas of public schooling, and the skills of ethical reasoning; professional code of ethics.

506 Social Context of Education 2 The interpretation of social context issues including historical, legal and cultural factors as these influence policies and practice in education.

507 Social Foundations of Education 3 Educational adaptations to the economic and social trends and forces.

510 Improvement of Instruction 3 Analysis and evaluation of instructional models with emphasis on information processing; implications for changing teaching style.

514 Basic Principles of Curriculum Design V 2-3 The application of theoretical concepts and approaches in the planning and design of curricula.

515 Curriculum Implementation 3 Research and practice; innovation and change in curricular organization emphasizing implementation.

516 Instructional and Curricular Leadership V 2-3 Theory, research, and practice of providing instructional and curricular leadership in schools and other educational settings.

518 Media Literacy and Educational Technology 3 Relates research and theory of media literacy to instructional resources and current leadership practices; problems of planning and administering programs.

520 Seminar in Curriculum and Instruction V 2-3 Contemporary issues, analyses and developments of educational programs.

521 Topics in Education V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and/or applications in selected areas of education.

522 Topics in Education V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and /or applications in selected areas of education.

531 Special Topics 1 May be repeated for credit; cumulative maximum 3 hours. Topical issues in education responding to shifting demands and skills needed by parents, teachers, school administrators and community leaders.

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534 Special Topics 1 May be repeated for credit; cumulative maximum 3 hours. Topical issues in education responding to shifting demands and skills needed by parents, teachers, school administrators and community leaders.

536 Introduction to Qualitative Research in Education 3 Prereq EdPsy 505. Introduction to the theory and methods of qualitative research; field relations, data collections, data analysis, hypothesis development, and theory generation.

537 Advanced Qualitative Research in Education 3 Prereq EdRes 564. Advanced theory and methods of qualitative research; theoretical foundations, data collection and analysis, and reporting.

538 Special Topics in Qualitative Research in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq Ed Ad 536. May be repeated for credit; cumulative maximum 6 hours.

560 Student Personnel Services in Higher Education 2 or 3 Philosophy, structure, functions, and organization of student affairs administration.

561 Introduction to College Student Development 3 Student development theory, related research and the application of theory to practice in student affairs work.

562 Professional Issues in Student Affairs Administration 3 Prereq Ed Ad 560, 561. The organization, programs and professional issues related to selected student affairs programs and units.

563 Research in College Student Development 3 Prereq Ed Ad 561. Critique, understand, and apply college social identity models as they relate to teaching, advising, and working with diverse student populations.

565 Practicum in Higher Education 3 (0-9) Prereq graduate student with 15 hours of completed course work in education. Selected supervised experiences in general higher education and student affairs settings provide for the investigation/application of theory/methods gained through formal course work.

567 Diversity in Higher Education 3 Prereq graduate standing. Reflection on experience and examination of the theory of practice or organizational leadership in the context of diversity.

568 Finance and Budgeting in Higher Education 3 Prereq undergraduate macro and microeconomics or by permission of instructor; graduate standing. Exposes students to the fundamentals of higher education budgeting and finance.

570 Community and Technical Colleges 3 For teachers and administrators. Development and function of community and technical colleges.

571 College Teaching 3 Concepts, principles, issues, and procedures in college curriculum development, and college teaching.

572 History of Higher Education 3 History, philosophy, objectives, and issues of colleges and universities as social institutions.

573 Issues in Higher Education 3 Selected contemporary issues in higher education.

578 Higher Education Law and Ethics 3 Legal and ethical aspects of higher education with special reference to administrators, faculty, and students in higher education institutions.

579 Administration of Higher Education 3 Organization, administration and leadership of universities, colleges, and community colleges.

580 School Organization and Administration 3 Readings and discussions on the theories and practices of school organization and administration.

581 Politics in Education 3 Prereq graduate standing. Examining the intrapersonal, organizational politics and political dilemma, particularly as they pertain to marginalized groups.

582 Policy Formation and Analysis in Education 3 Political and organizational policy formation processes in educational organizations; policy analysis in education.

583 Community and Communications 3 Social, political, and economic relationships between education and the community; methods of public polling and campaign strategy techniques.

584 Human Resource Management 3 Human relations in education; problems involved and practical solutions considered.

585 Financial Management in Education 3 Economics and financing of education; financial planning, budget development, investment analysis, bonding, cost effectiveness; current trends in educational finance.

587 Seminar in School Administration V 1-6 May be repeated for credit; cumulative maximum 6 hours. Interdisciplinary seminars; related studies; discussions in several areas by specialists.

588 The Law and Education 3 Fundamental legal principles within which public education functions; applicable school codes of Washington and other states; review important court cases.

589 Leadership Development Seminar 3 Improving knowledge and skills in strategic planning, decision making, leadership issues, conflict, motivation, staff development, productivity, and stress.

590 Internship V 3 (0-9) to 6 (0-18) May be repeated for credit; cumulative maximum 12 hours. By interview only. Internship in professional positions.

596 Preparing Grant Proposals 3 Identification of funding sources; analysis, evaluation, and production of grant proposals.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

EDPSY

570 Introduction to Program Evaluation 3 Prereq EdPsy 505. Introduction to strategies and techniques for evaluation of educational and social programs.

EDRES

563 Principles of Research 3 Prereq CoPsy 501 or EdRes 562 . The centrality of literature review and the understanding of methods used in educational research; practice in designing research questions.

564 Qualitative Research 3 Prereq EdRes 563. Theoretical underpinnings of qualitative research; familiarity with published qualitative research in education; practical research skills.

565 Quantitative Research 3 Prereq EdPsy 508; EdRes/EdPsy 563. Statistical literacy in educational research; parametric and non-parametric methods.

566 Research Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Prereq doctoral student. Presentation and analysis of research; professional development in research presentation.

Higher Education

Degree offered: Doctor of Education

Faculty working with graduate students: 8

Graduate students: 5

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal)

Deadline: Fall: January 10
Spring: September 1

Program Description

The graduate degree program in Higher Education Administration includes preparation at the master's and doctoral levels for students who plan to achieve positions of leadership in higher education administration and related fields or who wish to become faculty members. The Ph.D. in education offers specializations in higher education administration or student affairs.The Higher Education Administration Program offers five graduate degrees:â– Master of Arts (M.A.), specializing in higher education administration â– Master of Education (Ed.M.), specializing in higher education administrationâ– Doctor of Education (Ed.D.), specializing in communitycollege leadershipâ– Doctor of Education (Ed.D.), specializing in higher education administrationâ– Doctor of Philosophy (Ph.D.), specializing in higher education administrationâ– Doctor of Philosophy (Ph.D.), specializing in student affairsAs a graduate student, the College of Education's undergraduate leadership studies minor (with 100 to 150 undergraduate students) provides you with both research and teaching opportunities. In addition, other partnerships with university student affairs units provide further opportunities tied to the students' educational pursuits.Cleveland Hall is home to the George B. Brain Education Library, providing you with access to their main collection of education-related materials, a separate children's literature section, a media center, and a workroom.

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Post-Graduate Employment Opportunities

Faculty in higher education and student affairs programs; student affairs administrators; policy analysts; government relations; general university administrators; athletic administrators.

Post-Graduate Career Placements

Vice-president for student affairs; faculty at research universities; university provost; community college president; assistant director of recreation; academic coordinator.

Contact Information

Graduate Coordinator
Washington State University
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Pullman, WA 99164-2114
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Fax: 509-335-2097
E-mail: gradstudies@wsu.edu

Faculty

Alton Jamison, Milton Lang, Xyanthe Neider, Paul Pitre, Jason Sievers, Patricia Sturko, Kelly Ward and Christian Wuthrich.

ED AD

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571 College Teaching 3 Concepts, principles, issues, and procedures in college curriculum development, and college teaching.

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573 Issues in Higher Education 3 Selected contemporary issues in higher education.

578 Higher Education Law and Ethics 3 Legal and ethical aspects of higher education with special reference to administrators, faculty, and students in higher education institutions.

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587 Seminar in School Administration V 1-6 May be repeated for credit; cumulative maximum 6 hours. Interdisciplinary seminars; related studies; discussions in several areas by specialists.

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589 Leadership Development Seminar 3 Improving knowledge and skills in strategic planning, decision making, leadership issues, conflict, motivation, staff development, productivity, and stress.

590 Internship V 3 (0-9) to 6 (0-18) May be repeated for credit; cumulative maximum 12 hours. By interview only. Internship in professional positions.

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600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

EDPSY

502 Theoretical Foundations of Learning and Instruction 3 Historical and contemporary theories of learning and instruction: application of theory in counseling and teaching settings.

570 Introduction to Program Evaluation 3 Prereq EdPsy 505. Introduction to strategies and techniques for evaluation of educational and social programs.

EDRES

562 Epistemology, Inquiry, and Representation 3 Prereq doctoral standing; EdPsy 505 or c//. Epistemological assumptions and methodological strategies of research.

563 Principles of Research 3 Prereq CoPsy 501 or EdRes 562 . The centrality of literature review and the understanding of methods used in educational research; practice in designing research questions.

564 Qualitative Research 3 Prereq EdRes 563. Theoretical underpinnings of qualitative research; familiarity with published qualitative research in education; practical research skills.

Higher Education

Degree offered: Doctor of Philosophy (Education)

Faculty working with graduate students: 8

Graduate students: 16

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal)

Deadline: Fall: January 10
Spring: September 1

Program Description

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Degree Description

The higher education program is dedicated to meeting students' needs as current and future leaders and faculty in colleges, universities, or in athletic programs throughout the country. The program provides a balance and integration of research, theory, policy, and practical experience. Students examine the range of historical, social, legal, political, economic, and ethical issues that impact the practice and administration of higher education. The Ph.D. degree, with specializations in higher education, student affairs, or higher education administration, is designed to appeal to students who currently work in college or university administration or related fields, and who want to become faculty members or who would like to move into higher-ranking administrative positions.

Post-Graduate Employment Opportunities

Faculty in higher education and student affairs programs; student affairs administrators; policy analysts; government relations; general university administrators; athletic administrators.

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Faculty

Alton Jamison, Milton Lang, Xyanthe Neider, Paul Pitre, Jason Sievers, Patricia Sturko, Kelly Ward and Christian Wuthrich.

ED AD

501 Philosophy of Education 3 Development of American educational philosophy.

503 Values and Ethics for Educational Leaders 3 Study of ethical theories, the moral dilemmas of public schooling, and the skills of ethical reasoning; professional code of ethics.

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507 Social Foundations of Education 3 Educational adaptations to the economic and social trends and forces.

510 Improvement of Instruction 3 Analysis and evaluation of instructional models with emphasis on information processing; implications for changing teaching style.

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515 Curriculum Implementation 3 Research and practice; innovation and change in curricular organization emphasizing implementation.

516 Instructional and Curricular Leadership V 2-3 Theory, research, and practice of providing instructional and curricular leadership in schools and other educational settings.

518 Media Literacy and Educational Technology 3 Relates research and theory of media literacy to instructional resources and current leadership practices; problems of planning and administering programs.

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537 Advanced Qualitative Research in Education 3 Prereq EdRes 564. Advanced theory and methods of qualitative research; theoretical foundations, data collection and analysis, and reporting.

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560 Student Personnel Services in Higher Education 2 or 3 Philosophy, structure, functions, and organization of student affairs administration.

561 Introduction to College Student Development 3 Student development theory, related research and the application of theory to practice in student affairs work.

562 Professional Issues in Student Affairs Administration 3 Prereq Ed Ad 560, 561. The organization, programs and professional issues related to selected student affairs programs and units.

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565 Practicum in Higher Education 3 (0-9) Prereq graduate student with 15 hours of completed course work in education. Selected supervised experiences in general higher education and student affairs settings provide for the investigation/application of theory/methods gained through formal course work.

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568 Finance and Budgeting in Higher Education 3 Prereq undergraduate macro and microeconomics or by permission of instructor; graduate standing. Exposes students to the fundamentals of higher education budgeting and finance.

570 Community and Technical Colleges 3 For teachers and administrators. Development and function of community and technical colleges.

571 College Teaching 3 Concepts, principles, issues, and procedures in college curriculum development, and college teaching.

572 History of Higher Education 3 History, philosophy, objectives, and issues of colleges and universities as social institutions.

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578 Higher Education Law and Ethics 3 Legal and ethical aspects of higher education with special reference to administrators, faculty, and students in higher education institutions.

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800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

EDPSY

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503 Advanced Educational Psychology 2 Theories of learning and development as applied to education.

EDRES

562 Epistemology, Inquiry, and Representation 3 Prereq doctoral standing; EdPsy 505 or c//. Epistemological assumptions and methodological strategies of research.

563 Principles of Research 3 Prereq CoPsy 501 or EdRes 562 . The centrality of literature review and the understanding of methods used in educational research; practice in designing research questions.

564 Qualitative Research 3 Prereq EdRes 563. Theoretical underpinnings of qualitative research; familiarity with published qualitative research in education; practical research skills.

565 Quantitative Research 3 Prereq EdPsy 508; EdRes/EdPsy 563. Statistical literacy in educational research; parametric and non-parametric methods.

566 Research Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Prereq doctoral student. Presentation and analysis of research; professional development in research presentation.

Higher Education

Degree offered: Master of Arts in Education

Faculty working with graduate students: 8

Graduate students: 9

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal)

Deadline: Fall: January 10
Spring: September 1

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570 **Community and Technical Colleges** 3 For teachers and administrators. Development and function of community and technical colleges.

571 **College Teaching** 3 Concepts, principles, issues, and procedures in college curriculum development, and college teaching.

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EDPSY

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565 Quantitative Research 3 Prereq EdPsy 508; EdRes 563. Same as EdRes 565.

570 Introduction to Program Evaluation 3 Prereq EdPsy 505. Introduction to strategies and techniques for evaluation of educational and social programs.

Higher Education

Degree offered: Master of Arts in Education - Non Thesis

Faculty working with graduate students: 8

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal)

Deadline: Fall: January 10
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Requirements

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Degree offered: Master of Education

Faculty working with graduate students: 8

Graduate students: 19

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563 **Research in College Student Development** 3 Prereq Ed Ad 561. Critique, understand, and apply college social identity models as they relate to teaching, advising, and working with diverse student populations.

565 **Practicum in Higher Education** 3 (0-9) Prereq graduate student with 15 hours of completed course work in education. Selected supervised experiences in general higher education and student affairs settings provide for the investigation/application of theory/methods gained through formal course work.

567 **Diversity in Higher Education** 3 Prereq graduate standing. Reflection on experience and examination of the theory of practice or organizational leadership in the context of diversity.

568 Finance and Budgeting in Higher Education 3 Prereq undergraduate macro and microeconomics or by permission of instructor; graduate standing. Exposes students to the fundamentals of higher education budgeting and finance.

570 Community and Technical Colleges 3 For teachers and administrators. Development and function of community and technical colleges.

571 College Teaching 3 Concepts, principles, issues, and procedures in college curriculum development, and college teaching.

572 History of Higher Education 3 History, philosophy, objectives, and issues of colleges and universities as social institutions.

573 Issues in Higher Education 3 Selected contemporary issues in higher education.

578 Higher Education Law and Ethics 3 Legal and ethical aspects of higher education with special reference to administrators, faculty, and students in higher education institutions.

579 Administration of Higher Education 3 Organization, administration and leadership of universities, colleges, and community colleges.

580 School Organization and Administration 3 Readings and discussions on the theories and practices of school organization and administration.

581 Politics in Education 3 Prereq graduate standing. Examining the intrapersonal, organizational politics and political dilemma, particularly as they pertain to marginalized groups.

582 Policy Formation and Analysis in Education 3 Political and organizational policy formation processes in educational organizations; policy analysis in education.

583 Community and Communications 3 Social, political, and economic relationships between education and the community; methods of public polling and campaign strategy techniques.

584 Human Resource Management 3 Human relations in education; problems involved and practical solutions considered.

585 Financial Management in Education 3 Economics and financing of education; financial planning, budget development, investment analysis, bonding, cost effectiveness; current trends in educational finance.

587 Seminar in School Administration V 1-6 May be repeated for credit; cumulative maximum 6 hours. Interdisciplinary seminars; related studies; discussions in several areas by specialists.

588 The Law and Education 3 Fundamental legal principles within which public education functions; applicable school codes of Washington and other states; review important court cases.

589 Leadership Development Seminar 3 Improving knowledge and skills in strategic planning, decision making, leadership issues, conflict, motivation, staff development, productivity, and stress.

590 Internship V 3 (0-9) to 6 (0-18) May be repeated for credit; cumulative maximum 12 hours. By interview only. Internship in professional positions.

596 Preparing Grant Proposals 3 Identification of funding sources; analysis, evaluation, and production of grant proposals.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

EDPSY

502 Theoretical Foundations of Learning and Instruction 3 Historical and contemporary theories of learning and instruction: application of theory in counseling and teaching settings.

505 Research Methods I 3 Research methods; literature review; design, implementation, and interpretation of results.

Higher Education - Student Affairs

Degree offered: Doctor of Philosophy (Education)

Faculty working with graduate students: 8

Graduate students: 3

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal)

Deadline: Fall: January 10
Spring: September 1

Program Description

WSU's Educational Leadership program offers graduate studies at the masters and doctoral levels and administrator certification programs for the superintendent, residency principal, and residency program administrator certificates. The masters (M.A. and Ed.M.) and doctoral (Ed.D. and Ph.D.) degree programs offer specializations in K-12 educational leadership.Program faculty are dedicated to meeting students' needs as current and future K-12 educational leaders and to preparing future professors for work in academia. The program provides a balance and integration of practical experience, theory, and research and aims to prepare educational leaders who function as scholar-practitioners.Educational leadership programs are offered at all of WSU's campuses (Pullman, Spokane, Tri-Cities, and Vancouver). All campuses offer the Educational Leadership masters degrees, certification programs, and access to the statewide doctor of education degree (Ed.D.). One-year residency at the Pullman campus is required for the doctor of philosophy degree (Ph.D.).WSU's Educational Leadership program is one of 70 doctoral-granting programs nationwide selected for membership in the University Council for Educational Administration, a national consortium dedicated to the improvement of educational leadership preparation and practice. WSU's graduate students have the opportunity to participate in UCEA's annual convention and other professional activities.WSU's administrator certification programs are organized around the national ISLLC (Interstate School Leaders Licensure Consortium) standards, which have been adopted as the certification standards for Washington State licensure.. WSU's innovative cohort-based and field-based certification programs for principals and superintendents promote a close professional network. Faculty members for certification programs have extensive experience as school principals and/or central office administrators.

Degree Description

The higher education program is dedicated to meeting students' needs as current and future leaders and faculty in colleges, universities, or in athletic programs throughout the country. The program provides a balance and integration of research, theory, policy, and practical experience. Students examine the range of historical, social, legal, political, economic, and ethical issues that impact the practice and administration of higher education. The Ph.D. degree, with specializations in higher education, student affairs, or higher education administration, is designed to appeal to students who currently work in college or university administration or related fields, and who want to become faculty members or who would like to move into higher-ranking administrative positions.

Post-Graduate Employment Opportunities

Faculty in higher education and student affairs programs; student affairs administrators; policy analysts; government relations; general university administrators;

athletic administrators.

Post-Graduate Career Placements

Vice-president for student affairs; faculty at research universities; university provost; community college president; assistant director of recreation; academic coordinator.

Contact Information

Graduate Coordinator
Washington State University
Office of Graduate Studies
Cleveland Hall 252
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Pullman, WA 99164-2114
Telephone: 509-335-9195
Fax: 509-335-2097
E-mail: gradstudies@wsu.edu

Faculty

Alton Jamison, Milton Lang, Xyanthe Neider, Paul Pitre, Jason Sievers, Patricia Sturko, Kelly Ward and Christian Wuthrich.

ED AD

501 Philosophy of Education 3 Development of American educational philosophy.

503 Values and Ethics for Educational Leaders 3 Study of ethical theories, the moral dilemmas of public schooling, and the skills of ethical reasoning; professional code of ethics.

506 Social Context of Education 2 The interpretation of social context issues including historical, legal and cultural factors as these influence policies and practice in education.

507 Social Foundations of Education 3 Educational adaptations to the economic and social trends and forces.

510 Improvement of Instruction 3 Analysis and evaluation of instructional models with emphasis on information processing; implications for changing teaching style.

514 Basic Principles of Curriculum Design V 2-3 The application of theoretical concepts and approaches in the planning and design of curricula.

515 Curriculum Implementation 3 Research and practice; innovation and change in curricular organization emphasizing implementation.

516 Instructional and Curricular Leadership V 2-3 Theory, research, and practice of providing instructional and curricular leadership in schools and other educational settings.

518 Media Literacy and Educational Technology 3 Relates research and theory of media literacy to instructional resources and current leadership practices; problems of planning and administering programs.

520 Seminar in Curriculum and Instruction V 2-3 Contemporary issues, analyses and developments of educational programs.

521 Topics in Education V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and/or applications in selected areas of education.

522 Topics in Education V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and /or applications in selected areas of education.

531 Special Topics 1 May be repeated for credit; cumulative maximum 3 hours. Topical issues in education responding to shifting demands and skills needed by parents, teachers, school administrators and community leaders.

532 Special Topics 1 May be repeated for credit; cumulative maximum 3 hours. Topical issues in education responding to shifting demands and skills needed by parents, teachers, school administrators and community leaders.

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536 Introduction to Qualitative Research in Education 3 Prereq EdPsy 505. Introduction to the theory and methods of qualitative research; field relations, data collections, data analysis, hypothesis development, and theory generation.

537 Advanced Qualitative Research in Education 3 Prereq EdRes 564. Advanced theory and methods of qualitative research; theoretical foundations, data collection and analysis, and reporting.

538 Special Topics in Qualitative Research in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq Ed Ad 536. May be repeated for credit; cumulative maximum 6 hours.

560 Student Personnel Services in Higher Education 2 or 3 Philosophy, structure, functions, and organization of student affairs administration.

561 Introduction to College Student Development 3 Student development theory, related research and the application of theory to practice in student affairs work.

562 Professional Issues in Student Affairs Administration 3 Prereq Ed Ad 560, 561. The organization, programs and professional issues related to selected student affairs programs and units.

563 Research in College Student Development 3 Prereq Ed Ad 561. Critique, understand, and apply college social identity models as they relate to teaching, advising, and working with diverse student populations.

565 Practicum in Higher Education 3 (0-9) Prereq graduate student with 15 hours of completed course work in education. Selected supervised experiences in general higher education and student affairs settings provide for the investigation/application of theory/methods gained through formal course work.

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584 Human Resource Management 3 Human relations in education; problems involved and practical solutions considered.

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588 The Law and Education 3 Fundamental legal principles within which public education functions; applicable school codes of Washington and other states; review important court cases.

589 Leadership Development Seminar 3 Improving knowledge and skills in strategic planning, decision making, leadership issues, conflict, motivation, staff development, productivity, and stress.

590 Internship V 3 (0-9) to 6 (0-18) May be repeated for credit; cumulative maximum 12 hours. By interview only. Internship in professional positions.

596 Preparing Grant Proposals 3 Identification of funding sources; analysis, evaluation, and production of grant proposals.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

EDRES

562 Epistemology, Inquiry, and Representation 3 Prereq doctoral standing; EdPsy 505 or c//. Epistemological assumptions and methodological strategies of research.

563 Principles of Research 3 Prereq CoPsy 501 or EdRes 562 . The centrality of literature review and the understanding of methods used in educational research; practice in designing research questions.

564 Qualitative Research 3 Prereq EdRes 563. Theoretical underpinnings of qualitative research; familiarity with published qualitative research in education; practical research skills.

565 Quantitative Research 3 Prereq EdPsy 508; EdRes/EdPsy 563. Statistical literacy in educational research; parametric and non-parametric methods.

566 Research Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Prereq doctoral student. Presentation and analysis of research; professional development in research presentation.

History

Degree offered: Doctor of Philosophy (History)

Faculty working with graduate students: 24

Graduate students: 37

Graduate students receiving assistantships or scholarships: 72%

Tests required: GRE (Combined), TOEFL

Deadline: Fall: March 1
Spring: November 1

Requirements

Total of 72 credit hours (graded + ungraded) required for degree. Dissertation requires oral examination. Must pass a foreign language competency exam by the 3rd semester of degree program. Minimum of 6 credits in coursework from one or two disciplines outside of history as a minor.

Program Description

The Department of History at Washington State University offers graduate study leading to the Master of Arts (in both thesis and non-thesis options) and Doctor of Philosophy degrees. Our graduate program in history seeks to train professional researchers who are competent in historical theory and methods and prepares students for careers in historical research, public history, and teaching at colleges and universities. Specialized areas of study within the History Department include United States, early modern Europe, modern Europe, modern East Asia, environment, women, public, and world. Our department has long been recognized for its premiere graduate program in the American West-a region rich in cultural, social, and environmental diversity-as well as for its public history program. It also offers a unique pioneering program designed to grant a PhD in the field of world history.

Degree Description

The History Department offers programs of study for full time and part-time students leading to a Doctor of Philosophy (Ph.D.) degree. Students entering the Ph.D. program in History are expected to have completed a Masters degree in History or in a related field of study at an accredited college or university, and to show promise of doing excellent work at the doctoral level. All doctoral candidates conduct independent research leading to a written dissertation, with the objective of making a major contribution to the body of academic knowledge in History. Research will be focused on a specific Primary Field, which is embedded in a broader General Field that gives a geographical, chronological, and historiographical framework for the research. The student will also have a Comparative Field to provide a spatial and temporal context to the research. The program will culminate with a final oral examination. Financial aid in the form of an assistantship is available for dedicated, quality full time Ph.D. students.

Training and Professional Development Opportunities

History Dept has a committee dedicated to Graduate Professional Development. History grad students also organize a weekly colloquium in addition to weekly meetings of the History Graduate Students Association (HGSA). The HIST 595 course gives students knowledge and practice for teaching in higher education.

Post-Graduate Employment Opportunities

Students receiving a Doctor of Philosophy in History can go on to work with museums and curation, teach in secondary or higher education, and work as a historian at both private and governmental organizations providing research and cultural resource management expertise as well as ligation support.

Post-Graduate Career Placements

Tenured and adjunct faculty at research universities; chairs and deans of universities and community colleges; head librarians; self-employed researchers; historian for the NASA Johnson Space Center; president of a private historical organization.

Contact Information

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HIST

509 Field Course: Foundations in US History 3 May be repeated for credit; cumulative maximum 12 hours. Chronological readings in US history.

510 Field Course in American History 3 May be repeated for credit. Readings and interpretive problems of American history.

511 American Diplomatic History 1776-1914 3 Graduate-level counterpart of Hist 411; additional requirements. Credit not granted for both Hist 411 and 511.

512 American Diplomatic History in the 20th Century 3 Graduate-level counterpart of Hist 412; additional requirements. Credit not granted for both Hist 412 and 512.

513 Theory and Method in American Studies 3 May be repeated for credit. Same as Am St 513.

515 Jeffersonian-Jacksonian America 3 Graduate-level counterpart of Hist 415; additional requirements. Credit not granted for both Hist 415 and 515.

516 Civil War and Reconstruction 3 Graduate-level counterpart of Hist 416; additional requirements. Credit not granted for both Hist 416 and 516.

517 Rise of Modern America 3 Graduate-level counterpart of Hist 417; additional requirements. Credit not granted for both Hist 417 and 517.

518 United States, 1914-1945 3 Graduate-level counterpart of Hist 418; additional requirements. Credit not granted for both Hist 418 and 518.

519 United States, 1945-Present 3 Graduate-level counterpart of Hist 419; additional requirements. Credit not granted for both Hist 419 and 519.

521 The American West 3 Graduate-level counterpart of Hist 421; additional requirements. Credit not granted for both Hist 421 and 521.

522 History of the Pacific Northwest 3 Graduate-level counterpart of Hist 422; additional requirements. Credit not granted for both Hist 422 and 522.

523 Radicals, Reformers, and Romantics: The Impact 3 Graduate-level counterpart of Hist 423; additional requirements. Credit not granted for both Hist 423 and 523.

525 Seminar in American History 3 May be repeated for credit.

527 Public History: Theory and Methodology 3 Graduate-level counterpart of Hist 427; additional requirements. Credit not granted for both Hist 427 and 527.

528 Seminar in Public History 3 May be repeated for credit; cumulative maximum 6 hours. The development of skills at the graduate level to be used in nontraditional careers for historians.

529 Interpreting History through Material Culture 3 May be repeated for credit; cumulative maximum 6 hours. Historical interpretation to work on major historic preservation and museum projects.

530 History of Mexico 3 Graduate-level counterpart of Hist 430; additional requirements. Credit not granted for both Hist 430 and 530.

532 20th Century Latin America 3 Prereq graduate standing. Graduate-level counterpart of Hist 432; additional requirements. Credit not granted for both Hist 432 and 532.

533 History of Cuba and the Caribbean 3 Prereq graduate standing. Graduate-level counterpart of Hist 433; additional requirements. Credit not granted for both Hist 433 and 533.

534 Revolution in Latin America 3 Prereq graduate standing. Graduate-level counterpart of Hist 434; additional requirements. Credit not granted for both Hist 434 and 534.

535 Field Course in Latin American History 3 May be repeated for credit; cumulative maximum 9 hours. Readings and interpretive problems in Latin American history.

539 Slavery, Abolition and Emancipation in World History 3 Graduate-level counterpart of Hist 439; additional requirements. Credit not granted for both Hist 439 and 539.

540 Seminar in History 3 May be repeated for credit. Graduate standing; Hist 700 or Hist 800 or c//.

547 Europe in the French Revolutionary and Napoleonic Era, 1789 to 1815 3 Graduate-level counterpart of Hist 447; additional requirements. Credit not granted for both Hist 447 and 547.

549 Europe and Two World Wars, 1914-1945 3 Graduate-level counterpart of Hist 449; additional requirements. Credit not granted for both Hist 449 and 549.

550 Europe Since 1945 3 Graduate-level counterpart of Hist 450; additional requirements. Credit not granted for both Hist 450 and 550.

553 Conservatism, Liberalism, and Socialism: Europe, 1815-1870 3 Graduate-level counterpart of Hist 453; additional requirements. Credit not granted for both Hist 453 and 553.

554 Nationalism and National Conflict: Europe, 1870-1914 3 Graduate-level counterpart of Hist 454; additional requirements. Credit not granted for both Hist 454 and 554.

559 Modern Britain 3 Graduate-level counterpart of Hist 459; additional requirements. Credit not granted for both Hist 459 and 559.

560 Field Course in Early European History 3 May be repeated for credit; cumulative maximum 9 hours. Readings and issues in early European history.

561 Field Course in Early Modern European History 3 Readings and interpretive problems in early modern European history (1450 - 1750).

562 History of Imperial Russia 3 Graduate-level counterpart of Hist 462; additional requirements. Credit not granted for both Hist 462 and 562.

563 History of the Soviet Union 3 Graduate-level counterpart of Hist 463; additional requirements. Credit not granted for both Hist 463 and 563.

564 Comparative Genocide 3 Graduate-level counterpart of Hist 464; additional requirements. Credit not granted for both Hist 464 and 564.

567 Modern France 3 Graduate-level counterpart of Hist 467; additional requirements. Credit not granted for both Hist 467 and 567.

568 Hitler and Nazi Germany 3 Graduate-level counterpart of Hist 468; additional requirements. Credit not granted for both 468 and 568.

569 Field Course in Modern European History 3 May be repeated for credit; cumulative maximum 9 hours. Readings and interpretive problems in modern European history.

570 World History Theory and Methods 3 May be repeated for credit; cumulative maximum 9 hours. Historiographic overview of the field of world history.

571 Topics in World History 3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing. Readings in themes and literature of a global approach to history.

572 Middle East Since World War I 3 Graduate-level counterpart of Hist 472; additional requirements. Credit not granted for both Hist 472 and 572.

574 Modern South Asia: Community and Conflict 3 Graduate-level counterpart of Hist 474; additional requirements. Credit not granted for both Hist 474 and 574.

575 Field Course in Women's History 3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing. Readings and interpretive problems in women's history.

576 Revolutionary China, 1800 to Present 3 Graduate-level counterpart of Hist 476; additional requirements. Credit not granted for both Hist 476 and 576.

577 Modern Japanese History 3 Graduate-level counterpart of Hist 477; additional requirements. Credit not granted for both Hist 477 and 577.

578 Field Course in Asian History 3 May be repeated for credit; cumulative maximum 9 hours. Readings and interpretive problems in Asian history.

580 Historiography 3

595 The Teaching of History in College V 1-2 May be repeated for credit; cumulative maximum 5 hours. Theory, problems, and methods of teaching history at the college level.

596 Topics in American Studies 3 May be repeated for credit; cumulative maximum 9 hours. Graduate-level counterpart of Hist 496; additional requirements. Credit not granted for both Hist 496 and 596.

597 Seminar in History 2 or 3 May be repeated for credit.

598 History Internship V 1 (0-6) to 12 (0-36) May be repeated for credit; cumulative maximum 12 hours. Graduate-level counterpart of Hist 498; additional requirements. Credit not granted for both Hist 498 and 598.

599 History Colloquium 1 May be repeated for credit; cumulative maximum 4 hours. Weekly discussions and presentations on historical topics or current faculty and graduate student research.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

History

Degree offered: Master of Arts in History

Faculty working with graduate students: 24

Graduate students: 23

Graduate students receiving assistantships or scholarships: 43%

Program offered: Pullman, Vancouver

Tests required: GRE (Combined), TOEFL

Deadline: Fall: March 1 (January 10 international)
Spring: November 1 (July 1 international)

Requirements

Total of 30 credit hours (graded + ungraded) required for degree. Thesis option also requires oral examination.

Program Description

The Department of History at Washington State University offers graduate study leading to the Master of Arts (in both thesis and non-thesis options) and Doctor of Philosophy degrees. Our graduate program in history seeks to train professional researchers who are competent in historical theory and methods and prepares students for careers in historical research, public history, and teaching at colleges and universities. Specialized areas of study within the History Department include United States, early modern Europe, modern Europe, modern East Asia, environment, women, public, and world. Our department has long been recognized for its premiere graduate program in the American West-a region rich in cultural, social, and environmental diversity-as well as for its public history program. It also offers a unique pioneering program designed to grant a PhD in the field of world history.

Degree Description

The History Department offers programs of study for full time and part-time students leading to a Masters of Arts (MA) degree. Students entering the MA program in History are expected to show promise of doing excellent work at the graduate level. All MA students conduct independent research leading to a written thesis, with the objective of making a contribution to the body of academic knowledge in History. Research will be focused on a specific Primary Field, which is embedded in a broader General Field that gives a geographical, chronological, and historiographical framework for the research. The program will culminate with a final oral examination. The strong research emphasis and thesis experience prepare interested students for doctoral programs and careers in research and teaching. Financial aid in the form of an assistantship is available for dedicated, quality full time MA students.

Training and Professional Development Opportunities

History Dept has a committee dedicated to Graduate Professional Development. History grad students also organize a weekly colloquium in addition to weekly meetings of the History Graduate Students Association (HGSA). The HIST 595 course gives students knowledge and practice for teaching in higher education.

Post-Graduate Employment Opportunities

Students receiving a Masters in History can go on to work with museums and curation as well as teach in a secondary education setting and work as a research historian at both private and governmental organizations.

Post-Graduate Career Placements

Instructors in secondary education; curriculum development and educational publishing; assistant of education and curation at a museum; assistant director at a historic National Park Service site; research historians in private organizations.

Contact Information

Kenneth Anderson
Program Coordinator
History
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Washington State University
Pullman, WA 99164-4030
Telephone: 509-335-0432
Fax: 509-335-4171
E-mail: kwanderson@wsu.edu

Faculty

Emily Anderson, Robert Bauman, Peter Boag, Brigit Farley, Lydia Gerber, Candice Goucher, Steven Hoch, Theresa Jordan, Steven Kale, Noriko Kawamura, Robert McCoy, Laurie Mercier, Susan Peabody, David Pietz, Jeffrey Sanders, Jesse Spohnholz, Heather Streets, Raymond Sun, Matthew Sutton, Orlan Svingen, Jennifer Thigpen, Joel Tishken, Marina Tolmacheva and Xiuyu Wang.

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577 Modern Japanese History 3 Graduate-level counterpart of Hist 477; additional requirements. Credit not granted for both Hist 477 and 577.

578 Field Course in Asian History 3 May be repeated for credit; cumulative maximum 9 hours. Readings and interpretive problems in Asian history.

580 Historiography 3

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596 Topics in American Studies 3 May be repeated for credit; cumulative maximum 9 hours. Graduate-level counterpart of Hist 496; additional requirements. Credit not granted for both Hist 496 and 596.

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598 History Internship V 1 (0-6) to 12 (0-36) May be repeated for credit; cumulative maximum 12 hours. Graduate-level counterpart of Hist 498; additional requirements. Credit not granted for both Hist 498 and 598.

599 History Colloquium 1 May be repeated for credit; cumulative maximum 4 hours. Weekly discussions and presentations on historical topics or current faculty and graduate student research.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

History

Degree offered: Master of Arts in History - Non Thesis

Faculty working with graduate students: 24

Graduate students: 1

Program offered: Pullman, Vancouver

Tests required: GRE (Combined), TOEFL

Deadline: Fall: March 1
Spring: November 1

Requirements

Total of 30 credit hours (graded + ungraded) required for degree. Non thesis option also requires oral examination.

Program Description

The Department of History at Washington State University offers graduate study leading to the Master of Arts (in both thesis and non-thesis options) and Doctor of Philosophy degrees. Our graduate program in history seeks to train professional researchers who are competent in historical theory and methods and prepares students for careers in historical research, public history, and teaching at colleges and universities. Specialized areas of study within the History Department include United States, early modern Europe, modern Europe, modern East Asia, environment, women, public, and world. Our department has long been recognized for its premiere graduate program in the American West-a region rich in cultural, social, and environmental diversity-as well as for its public history program. It also offers a unique pioneering program designed to grant a PhD in the field of world history.

Degree Description

The History Department offers programs of study for full time and part-time students leading to a Masters of Arts (MA) degree with a non-thesis option. Students entering the MA program in History are expected to show promise of doing excellent work at the graduate level. All non-thesis MA students conduct independent research leading to a non-thesis project made up of several smaller essays. The program will culminate with a final oral examination. The strong research emphasis and writing experience prepare interested students for careers in research and teaching. Financial aid in the form of an assistantship is available for dedicated, quality full time MA students. The non-thesis MA is typically considered to be a terminal degree.

Training and Professional Development Opportunities

History Dept has a committee dedicated to Graduate Professional Development. History grad students also organize a weekly colloquium in addition to weekly meetings of the History Graduate Students Association (HGSA). The HIST 595 course gives students knowledge and practice for teaching in higher education.

Post-Graduate Employment Opportunities

Students receiving a Masters in History can go on to work with museums and curation as well as teach in a secondary education setting and work as a research historian at both private and governmental organizations.

Contact Information

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Faculty

Emily Anderson, Robert Bauman, Peter Boag, Brigit Farley, Lydia Gerber, Candice Goucher, Steven Hoch, Theresa Jordan, Steven Kale, Noriko Kawamura, Robert McCoy, Laurie Mercier, Susan Peabody, David Pietz, Jeffrey Sanders, Jesse Spohnholz, Heather Streets, Raymond Sun, Matthew Sutton, Orlan Svingen, Jennifer Thigpen, Joel Tishken, Marina Tolmacheva and Xiuyu Wang.

HIST

580 Historiography 3

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Horticulture

Degree offered: Doctor of Philosophy (Horticulture)

Faculty working with graduate students: 28

Graduate students: 16

Program offered: Pullman, Tri-Cities

Tests required: GRE (Combined), TOEFL, GRE (Quantitative), GRE (Verbal), TOEFLI

Deadline: Fall: January 10
Spring: July 1

Program Description

The graduate program in horticulture has a long history of excellence in graduate education. Graduates from the program are employed in careers ranging from applied crop production to teaching and research in the molecular mechanisms controlling plant growth and development. Graduate work can be basic or applied, and students

acquire experience in both teaching and research. Students generally focus their research on solving a production or post-harvest quality issue for a particular commodity (vegetable crop, tree fruits, small fruits, viticulture and enology, ornamentals), or on the more basic areas of plant physiology, biochemistry, molecular genetics, genomics and breeding, and bioinformatics. Interdisciplinary areas such as plant pathology, soils, entomology, biological systems engineering, environmental science, foods and nutrition, and the social sciences are often included. Research projects may address problems or situations related to the growth, production, or utilization of any horticultural commodity. Thesis projects, course requirements, and teaching experiences are individualized to the specific interests and goals of the student. After completion of course work students may have the opportunity to conduct research at one of several Research & Extension Centers located throughout the state. Graduates are placed in highly regarded laboratories; in respected research, teaching, and extension programs at universities; in industry, and with government and non-governmental agencies.

Degree Description

All doctoral candidates conduct independent research leading to a dissertation, with the objective of making a major contribution to the body of scientific knowledge in Horticulture. Portions of the dissertation research are normally published in peer-reviewed journals. Students in this degree option are expected to have completed a research-based master's degree or to have equivalent research experience prior to enrolling in the doctoral program.

Post-Graduate Employment Opportunities

University faculty positions; Federal and state agricultural laboratories; Extension specialists; Management positions in allied and agricultural industries; Technical positions; Postdoctoral positions.

Post-Graduate Career Placements

Assistant professor/assistant landscape specialist, University of Hawaii;Assistant professor, Penn State University;Product specialist, Thermo Electron Corporation, San Jose, CA;Extension educator, WSU Extension, Adams/Grant county, WA;Director of new market development, AgroFresh, Inc., Springhouse, PA;Research plant physiologist, Eastern Regional Research Laboratory, USDA/ARS, Philadelphia, PA

Contact Information

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Horticulture and Landscape Architecture
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Faculty

Preston Andrews, Bhaskar Bondada, Charles Brown, Linda Chalker-Scott, Carter Clary, Clarice Coyne, Eric Curry, Amit Dhingra, Donald Elfving, Katherine Evans, John Fellman, Rita Hummel, Markus Keller, Norman Knowles, Mohan Kumar, Virginia Lohr, Doreen Main, James Mattheis, Carol Miles, Patrick Moore, Michelle Moyer, Nnadozie Oraguzie, Mark Pavek, Cameron Peace, B Poovaiah, Julie Tarara, Thomas Walters and Matthew Whiting.

HORT

509 **Seminar** 1 May be repeated for credit; cumulative maximum 4 hours. Continuous enrollment required for regularly enrolled graduate students in horticulture. Recent developments in horticulture.

510 **Graduate Seminar** 1 May be repeated for credit; cumulative maximum 4 hours. Literature reviews and research progress reports.

800 **Doctoral Research, Dissertation, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

Horticulture

Degree offered: Master of Science in Horticulture

Faculty working with graduate students: 28

Graduate students: 17

Program offered: Pullman, Tri-Cities

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal), TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Program Description

The graduate program in horticulture has a long history of excellence in graduate education. Graduates from the program are employed in careers ranging from applied crop production to teaching and research in the molecular mechanisms controlling plant growth and development. Graduate work can be basic or applied, and students acquire experience in both teaching and research. Students generally focus their research on solving a production or post-harvest quality issue for a particular commodity (vegetable crop, tree fruits, small fruits, viticulture and enology, ornamentals), or on the more basic areas of plant physiology, biochemistry, molecular genetics, genomics and breeding, and bioinformatics. Interdisciplinary areas such as plant pathology, soils, entomology, biological systems engineering, environmental science, foods and nutrition, and the social sciences are often included. Research projects may address problems or situations related to the growth, production, or utilization of any horticultural commodity. Thesis projects, course requirements, and teaching experiences are individualized to the specific interests and goals of the student. After completion of course work students may have the opportunity to conduct research at one of several Research & Extension Centers located throughout the state. Graduates are placed in highly regarded laboratories; in respected research, teaching, and extension programs at universities; in industry, and with government and non-governmental agencies.

Degree Description

This is a research-based degree, involving a formal, major research project. The objectives are to train students in the experimental method and to prepare students for handling major projects after graduation or for entering a doctoral program.

Post-Graduate Employment Opportunities

Federal and state agricultural laboratoriesExtension agentsManagement positions in allied and agricultural industriesTeaching positionsTechnical positions

Post-Graduate Career Placements

Wine Export ManagerAssistant Production Manager for NurseryAssistant WinemakerResearch AssociateDoctoral Program

Contact Information

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HORT

509 **Seminar** 1 May be repeated for credit; cumulative maximum 4 hours. Continuous enrollment required for regularly enrolled graduate students in horticulture. Recent developments in horticulture.

510 Graduate Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Literature reviews and research progress reports.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Human Development

Degree offered: Master of Arts in Human Development

Faculty working with graduate students: 21

Graduate students: 16

Graduate students receiving assistantships or scholarships: 100%

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal), IELTS, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Program Description

The program is a prevention-based graduate program that promotes the well-being of children, youth, and families. Through their coursework, research, and practical experiences, students receive an integrated education in developmental and family theories, research, and application. Using a prevention science approach, the master's program provides students with valuable skills such as needs assessment, program development, and program evaluation that prepare them for careers in educational and social service settings; the strong research emphasis and thesis experience prepare interested students for doctoral programs and careers in research and teaching.Numerous departmental resources support the integrative mission of the program, including the Child Development Laboratory, a department-run, on-campus early childhood program, and university extension programs for youth and families throughout the state.Graduates of the program are highly desired by employers in human service agencies, early childhood education, school-age child care programs, Head Start, programs for adolescents, and community college teaching.

Degree Description

The program is a prevention-based graduate program that promotes the well-being of children, youth, and families. Through their coursework, research, and practical experiences, students receive an integrated education in developmental and family theories, research, and application. Using a prevention science approach, the master's program provides students with valuable skills such as needs assessment, program development, and program evaluation that prepare them for careers in educational and social service settings; the strong research emphasis and thesis experience prepare interested students for doctoral programs and careers in research and teaching.Numerous departmental resources support the integrative mission of the program, including the Child Development Laboratory, a department-run, on-campus early childhood program, and university extension programs for youth and families throughout the state.Graduates of the program are highly desired by employers in human service agencies, early childhood education, school-age child care programs, Head Start, programs for adolescents, and community college teaching.

Training and Professional Development Opportunities

Conferences, Research Assistantships

Post-Graduate Employment Opportunities

Human services administration (e.g., director of a community action center); Primary service (e.g., parent educator, family case worker, probation couselor); Policy development (e.g., state agencies, advocacy work); University cooperative extension (e.g., 4-H, family living faculty); Prevention positions (e.g., school district or health department positions); Communtiy college teaching.

Post-Graduate Career Placements

Health Education Specialist for the State Health Preparedness Program (Idaho Division of Public Health, Boise)Grants Manager, Project Access, Moscow IdahoProject Coordinator/Research Associate, University of VirginiaGrant Coordinator, Thrive by Five, SeattleResearch Analyst, Meryhurst Civic Institute, PennsylvaniaData Services Manager, Educational Service District 113, WashingtonHuman Development Distance Education Instructor (WSU)Director, Gender Identity/Expression and Sexual Orientation Resource Center, WSUExtension Educator and Program Evaluation Specialist, University of Minnesota ExtensionProgram Specialist for WSU Well-BeingPeace Corps VolunteerGeneral Preventative Case Planner (New York City)Center Supervisor for Friends of Children and Families (manages two Head Start grantees in the Boise area)Vocational Specialist, Community Psychiatric Clinic, SeattleHuman Development instructor, WSU Pullman

Contact Information

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Faculty

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Human Development

H D

511 Theory and Substance of Human Development I 3 Prereq graduate standing. Human development theories; application to life span development, cultural variations, resources, problem solving, interaction of families and individuals with other systems.

513 Research Methods in Human Development I 3 Prereq graduate standing. Introduction to process of research and methods in human development; techniques of research, data collection, and data analysis procedures.

514 Research Methods in Human Development II 3 Prereq H D 513. Integration of formal decision making into the social science research process; procedures appropriate for experimental, quasi-experimental and field research.

520 Adolescence 3 Prereq graduate standing. In-depth examination of theories and research, developmental issues and prevention and intervention programs for school-aged children and adolescents.

535 Program Development in Child and Family Studies 3 Prereq graduate standing. Analysis and development of program delivery systems, curricula and evaluation models.

540 Effective Intervention Programs 3 Prereq H D 530. Innovative effective prevention and intervention programs from theoretical, applied, and outcome evaluation perspectives.

550 Seminar on Family Relationships 3 Prereq graduate standing. Survey of family studies topics and issues examined from a research point of view.

558 Parent-Child Relationships 3 The reciprocal interactions among family members will be examined; theoretical perspectives and empirical findings will be explored in terms of implications for education and practice.

560 Seminar in Child Development 3 Prereq graduate standing. Survey of literature on selected areas in child development; discussion of research and application related to current issues and trends.

561 Advanced Assessment and Evaluation in Early Childhood Programs 3 Prereq H D 560. Investigating: Best classroom practices for creating early learning environments, use of observation and documentation to evaluate and improve quality.

562 Administration and Leadership in Programs 3 Examining early childhood administrator role; analysis and application of research to administration, developing concrete skills necessary for successful administration.

580 Families, Community and Public Policy 3 Prereq H D 513, 514, or approved graduate research methods course. Analysis of family policy research; role of family policy research in public policy and knowledge building processes.

586 Special Topics in Human Development V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing. Assessment and evaluation of families and children.

598 Professional Internship 3 Prereq H D 510. Supervised individual experiences with related organizations, businesses, or government agencies; opportunities for interaction with professionals in related fields.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Human Development

Degree offered: Master of Arts in Human Development - Non Thesis

Program Description

The program is a prevention-based graduate program that promotes the well-being of children, youth, and families. Through their coursework, research, and practical experiences, students receive an integrated education in developmental and family theories, research, and application. Using a prevention science approach, the master's program provides students with valuable skills such as needs assessment, program development, and program evaluation that prepare them for careers in educational and social service settings; the strong research emphasis and thesis experience prepare interested students for doctoral programs and careers in research and teaching.Numerous departmental resources support the integrative mission of the program, including the Child Development Laboratory, a department-run, on-campus early childhood program, and university extension programs for youth and families throughout the state.Graduates of the program are highly desired by employers in human service agencies, early childhood education, school-age child care programs, Head Start, programs for adolescents, and community college teaching.

Human Nutrition

Degree offered: Master of Science in Human Nutrition

Faculty working with graduate students: 2

Graduate students: 20

Program offered: Spokane

Deadline: Fall: February 1 (January 10 international)

Requirements

The supervised practice experience requirement is currently 1200 hours. The 1200 hours of supervised practice consists of 160 hours in a food management rotation, 440 hours in a clinical rotation, 200 hours in a community rotation, and 400 hours in an exercise physiology internship.

Program Description

The Master of Science Coordinated Program in Dietetics Nutrition and Exercise Physiology -- MS CPD NEP -- is a professional certification degree designed for those individuals whose career goal is to become eligible to take the Registered Dietitian examination through the American Dietetic Association, Graduates of the program are expected to function effectively as entry-level dietetics practitioners in a clinical, administrative, or community setting. The supervised practice experience requirement is currently 1200 hours. The 1200 hours of supervised practice consists of 160 hours in a food management rotation, 440 hours in a clinical rotation, 200 hours in a community rotation, and 400 hours in an exercise physiology internship.

Degree Description

The Master of Science Coordinated Program in Dietetics Nutrition and Exercise Physiology -- MS CPD NEP -- is a professional certification degree designed for those individuals whose career goal is to become eligible to take the Registered Dietitian examination through the American Dietetic Association, Graduates of the program are expected to function effectively as entry-level dietetics practitioners in a clinical, administrative, or community setting. The supervised practice experience requirement is currently 1200 hours. The 1200 hours of supervised practice consists of 160 hours in a food management rotation, 440 hours in a clinical rotation, 200 hours in a community rotation, and 400 hours in an exercise physiology internship.

Post-Graduate Employment Opportunities

Most registered dietitians work at hospitals and medical centers, private practice or other health-care facilities. Many work in community and public health settings, academia and research. Others work in food and nutrition industry and business, journalism, sports nutrition, corporate wellness programs and in other nontraditional settings.

Post-Graduate Career Placements

Community and public health settings, Teaching dietetic students, Research areas

Contact Information

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Faculty

Janet Beary and Kathryn Meier.

BIOL

102 General Biology 4 (3-3) Understanding biology as a science and its effect on issues within society. Lecture and laboratory; not for students majoring in the life sciences. Credit granted only to students who have not already completed Biol 101, 105, or Biol 101 and 105. Credit not granted to students who have already completed Biol 106 and/or 107. Students who declare a major requiring Biol 106 and/or 107 will need to complete those courses for credit toward their major.

140 Introduction to Nutritional Science 3 Information related to the interaction of nutrients in the body and factors that govern nutrient requirements.

251 Introductory Human Physiology 4 (3-3) Prereq Biol 102, 106, or 107; Basic physiological processes in humans from the cellular to the organismal level.

315 Gross and Microanatomy 4 (3-3) Prereq one semester biology; sophomore standing; cumulative WSU gpa 2.5; or permission of department. Gross and microscopic anatomy of the human body.

CHEM

101 Introduction to Chemistry 4 (3-3) Prereq satisfactory math placement score. Basic chemical concepts; atomic theory, periodicity, reaction stoichiometry, gases, solutions, acids, basis, pH, equilibrium, kinetics, energy, applications to life sciences.

102 Chemistry Related to Life Sciences 4 (3-3) Prereq Chem 101, 105, or 115 with a grade of C or better. Organic functional groups and their reactions; polymers, macro-molecules; carbohydrates, lipids, proteins, enzymes, nucleic acids, hormones, applications to life sciences.

COMST

102 Public Speaking: Theory, Models, and Practice 3 An introduction to the theory and practice of speaking in formal settings.

Food Science/Human Nutrition

FSHN

330 Physiological Nutrition 3 Prereq Biol 251; Chem 345; FSHN 130 or 233. Functional chemistry of nutrients in physiological systems and nutrient interactions.

Food Science/Human Nutrition

MBIOS

101 Introductory Microbiology 4 (3-3) Microbiology for the informed citizen as it impacts humans and their environment. Not for students who have taken Biol 106 and 107.

303 Introductory Biochemistry 4 Prereq Chem 106; Chem 345. Modern biochemistry for undergraduates in the biological sciences.

Food Science/Human Nutrition

PHIL

103 Introduction to Ethics 3 Ethics through analysis of contemporary moral and social issues.

Food Science/Human Nutrition

PSYCH

105 Introductory Psychology 3 Contemporary psychology; biological and social influences on normal and abnormal human behavior. Credit not granted for both Psych 105 and 198.

Food Science/Human Nutrition

STAT

205 Statistical Thinking 3 Prereq Math 103 or intermediate math placement score of 13. Scientific explanation; correlations and causality; presenting statistical evidence; graphical and numerical methods; chance and gambling; the bell-shaped distribution.

Individual Interdisciplinary

Degree offered: Doctor of Philosophy (Individual Interdisciplinary)

Faculty working with graduate students: 27

Graduate students: 17

Tests required: IELTS, MELAB, TOEFL, TOEFLI

Deadline: Fall: January 10

Program Description

The individual interdisciplinary doctoral program is designed to meet the professional interests and research endeavors of each student. Although the program maintains a high degree of flexibility, it is a rigorous program and requires the involvement of the Graduate School as well as several academic units on campus. The degree offers a unique opportunity for students seeking a breadth of knowledge not available within one particular discipline.

Degree Description

Each student works with an advisor and four additional members of the WSU faculty from at least three academic units. This committee oversees the development of the individual doctoral degree and works closely with the student to ensure a high quality doctoral education. The individual doctoral program must meet the following criteria: it will be of doctoral significance, no single recognized graduate degree-granting unit will be able to meet the student's needs, and the academic resources to complete the proposed program will be available at WSU.

Training and Professional Development Opportunities

IIDP is not able to offer assistantship funding; however many IIDP students do hold assistantships through one of their identified disciplines from their program.

Post-Graduate Employment Opportunities

Since 1983, approximately 85 individual interdisciplinary doctorates have been earned at WSU. Graduates of the program now work as university and college faculty as well as educational and business consultants and in government positions around the world.

Contact Information

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UNIV

580 Leadership Development V 1-3 Prereq permission of instructor. Meetings and workshops designed to develop professional and leadership skills for doctoral students.

590 Preparation for College Teaching 2 Prereq graduate standing/TA appointment. Cross-discipline instructional development for graduate teaching assistants; course development teaching techniques, university policies and procedures.

591 Interdisciplinary Studies 1 May be repeated for credit. Contemporary issues in interdisciplinary education and research. Open to all interested students.

598 Interdisciplinary Seminar 1 May be repeated for credit; cumulative maximum 3 hours. Prereq Univ 591. Seminar on theory and practice of advanced interdisciplinary doctoral study.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit. For Interdisciplinary PhD only.

Interdisciplinary Environmental Biogeochemistry - Cert in Int Env Biogeochemistry

Degree offered: Graduate Certificate in Interdisciplinary Environmental Biogeochemistry

Requirements

Please see the program/department for more information.

Interior Design

Degree offered: Master of Arts in Interior Design

Faculty working with graduate students: 8

Graduate students: 22

Graduate students receiving assistantships or scholarships: 9%

Program offered: Spokane

Tests required: IELTS, TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: We do not accept spring applications.

Requirements

Please see the MA Interior Design graduate handbook at http://id.wsu.edu/graduate/ for detailed information about credit requirements, course descriptions and program information for each track (1, 2 and 3 year; thesis and non-thesis).

Program Description

WSU offers an exciting Master of Arts Degree in Interior Design focused on environment and design applications within the context of a cross-disciplinary program. The program increases students' understanding of the relationship between human behavior and interior environments through advanced study and hands-on research. The program also builds on the design studio experience to provide students with an opportunity for further exploration and discovery in the field. Students gain knowledge and skills that prepare them to analyze information and relationships, evaluate issues, and set priorities, while creativing functional and high quality design solutions for complex projects.The Interior Design faculty mentor graduate students in advising and teaching, serving on graduate committees, making contributions to readings and research methods seminars, supervising independent study projects and serving on graduate committees.

Degree Description

The Department of Interior Design (located on the Washington State University Spokane campus) is part of the College of Agricultural, Human, and Natural Resource Sciences (located in Pullman, WA) and participates in the Interdisciplinary Design Institute on the Spokane campus. Courses of study leading to a Bachelor of Arts (BA) in Interior Design, and a Master of Arts (MA) in Interior Design are offered. The philosophy of the Interior Design program is based on a concern for human beings and the creation of interior settings that support human activities and values. Graduates of the program in Interior Design should be able to think clearly and creatively and to solve problems in a professionally competent manner. Above all, an interior design education will help the student to develop intellectual curiosity, which allows the graduate to continue to develop as a person and as a designer throughout life. The MA Interior Design is offered solely at the WSU Spokane campus through the Department of Interior Design and the Interdisciplinary Design Institute. The Institute represents a unique collaboration among the design disciplines with students and faculty from interior design, architecture and landscape architecture working and learning together in a team-oriented, urban environment. Upon completion of the program students are able to analyze information and relationships, evaluate issues and set priorities while generating creative design solutions for projects of a complex scale. Graduates have the ability to take initiative, make critical judgments of their own work and that of others, and contribute to the overall well-being of people as they interact with interior environments.The MA combines studio design experience with qualitative and quantitative research methodologies to further understanding and increase awareness of the interface between human behavior and interior environments. The MA builds on the studio design experience to expand students' understanding of the theoretical and analytical frameworks applicable to the pursuit of discovery in the field. The MA also provides a strong interdisciplinary knowledge and practice background for those working toward the PhD or Doctor of Design. The goals of the MA degree are: * To provide students with opportunities to explore advanced design theories, problem-solving techniques, methodologies, and individual research and design applications; * To provide students with opportunities for interdisciplinary exchange through the core curriculum at the Interdisciplinary Design Institute; * To contribute to and advance the body of knowledge pertaining to interior design and the built and natural environments; * To prepare graduates to pursue careers as interior design educators, directors of interior design research, and/or practitioners of interior design.Students pursuing a post professional graduate degree (2-year program) will complete a written thesis, while students pursuing the 1-year program and the first professional graduate degree (3-year program) will complete a research project.

Post-Graduate Employment Opportunities

Graduates of this program are prepared for successful careers as interior design practitioners, educators and researchers.

Post-Graduate Career Placements

FACULTY POSITIONS: Assistant Professor, Utah State University; Assistant Professor, Washington State University; Interior Design Department Chair, Monterey Community College; Instructor, University of New Haven Connecticut; Instructor, Art Institute (Portland); Instructor, Highline Community College (Tacoma)DOCTORAL PROGRAMS: Doctor of Design (Washington State University); PhD in Architecture (University of Hawaii)PROFESSIONAL PRACTICE: ADN Designs (Seattle); Avery Brooks & Associates (Las Vegas); Callison (Seattle); Carletti Architects (Mount Vernon); Carrier Johnson (San Diego); Collins Woerman (Seattle); Decorum Design (Spokane); Design Naturale (Boise); Evans Design Firm (Kansas); Executive Director, Habitat for Humanity (N. Idaho); Holland Roth (Canada); JAD (South Korea); JC Interior Design Studio (Seattle); Jennifer Randall (Seattle); John Rovtar (Spokane); KDF (Yakima); Main Streeet Manager (Oregon); Myhre Group (Portland); Milieu (Spokane); NBBJ (Seattle); OMS (Spokane); San Diego State Capital Planning; Wagner Architects (Seattle); Weber Thompson (Seattle)

Contact Information

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Faculty

Nancy Blossom, Linda Johnson, Robert Krikac, Janetta McCoy, Matthew Melcher, Kathleen Ryan, Judith Theodorson and John Turpin.

EDPSY

505 Research Methods I 3 Research methods; literature review; design, implementation, and interpretation of results.

Interior Design

I D

525 Interior Design Graduate Studio I 5 (0-10) Prereq I D 426. Graduate studio: application of advanced design theories, philosophies and research methodologies to enhance undergraduate design foundations through interdisciplinary studio experiences.

530 Philosophies and Theories of the Built Environment 3 Prereq graduate standing in Arch/I D/L A. Same as Arch 530.

560 Interdisciplinary Seminar 3 Prereq graduate standing. Same as Arch 560.

594 Readings in Interior Design 3 Prereq graduate standing. Exploration of current topics through readings in interior design.

598 Topics in Interior Design V 1-3 May be repeated for credit; cumulative maximum 6 hours.

700 Masterâ™s Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Interior Design

Degree offered: Master of Arts in Interior Design - Non Thesis

Faculty working with graduate students: 8

Graduate students: 22

Graduate students receiving assistantships or scholarships: 9%

Program offered: Spokane

Tests required: IELTS, TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

Please see the MA Interior Design graduate handbook at http://id.wsu.edu/graduate/ for detailed information about credit requirements, course descriptions and program information for each track (1, 2 and 3 year; thesis and non-thesis).

Program Description

WSU offers an exciting Master of Arts Degree in Interior Design focused on environment and design applications within the context of a cross-disciplinary program. The program increases students' understanding of the relationship between human behavior and interior environments through advanced study and hands-on research. The program also builds on the design studio experience to provide students with an opportunity for further exploration and discovery in the field. Students gain knowledge and skills that prepare them to analyze information and relationships, evaluate issues, and set priorities, while creativing functional and high quality design solutions for complex projects.The Interior Design faculty mentor graduate students in advising and teaching, serving on graduate committees, making contributions to readings and research methods seminars, supervising independent study projects and serving on graduate committees.

Degree Description

The Department of Interior Design (located on the Washington State University Spokane campus) is part of the College of Agricultural, Human, and Natural Resource Sciences (located in Pullman, WA) and participates in the Interdisciplinary Design Institute on the Spokane campus. Courses of study leading to a Bachelor of Arts (BA) in Interior Design, and a Master of Arts (MA) in Interior Design are offered. The philosophy of the Interior Design program is based on a concern for human beings and the creation of interior settings that support human activities and values. Graduates of the program in Interior Design should be able to think clearly and creatively and to solve problems in a professionally competent manner. Above all, an interior design education will help the student to develop intellectual curiosity, which allows the graduate to continue to develop as a person and as a designer throughout life. The MA Interior Design is offered solely at the WSU Spokane campus through the Department of Interior Design and the Interdisciplinary Design Institute. The Institute represents a unique collaboration among the design disciplines with students and faculty from interior design, architecture and landscape architecture working and learning together in a team-oriented, urban environment. Upon completion of the program students are able to analyze information and relationships, evaluate issues and set priorities while generating creative design solutions for projects of a complex scale. Graduates have the ability to take initiative, make critical judgments of their own work and that of others, and contribute to the overall well-being of people as they interact with interior environments.The MA combines studio design experience with qualitative and quantitative research methodologies to further understanding and increase awareness of the interface between human behavior and interior environments. The MA builds on the studio design experience to expand students' understanding of the theoretical and analytical frameworks applicable to the pursuit of discovery in the field. The MA also provides a strong interdisciplinary knowledge and practice background for those working toward the PhD or Doctor of Design. The goals of the MA degree are: * To provide students with opportunities to explore advanced design theories, problem-solving techniques, methodologies, and individual research and design applications; * To provide students with opportunities for interdisciplinary exchange through the core curriculum at the Interdisciplinary Design Institute; * To contribute to and advance the body of knowledge pertaining to interior design and the built and natural environments; * To prepare graduates to pursue careers as interior design educators, directors of interior design research, and/or practitioners of interior design.Students pursuing a post professional graduate degree (2-year program) will complete a written thesis, while students pursuing the 1-year program and the first professional graduate degree (3-year program) will complete a research project.

Post-Graduate Employment Opportunities

Graduates of this program are prepared for successful careers as interior design practitioners, educators and researchers.

Post-Graduate Career Placements

FACULTY POSITIONS: Assistant Professor, Utah State University; Assistant Professor, Washington State University; Interior Design Department Chair, Monterey Community College; Instructor, University of New Haven Connecticut; Instructor, Art Institute (Portland); Instructor, Highline Community College (Tacoma)DOCTORAL PROGRAMS: Doctor of Design (Washington State University); PhD in Architecture (University of Hawaii)PROFESSIONAL PRACTICE: ADN Designs (Seattle); Avery Brooks & Associates (Las Vegas); Callison (Seattle); Carletti Architects (Mount Vernon); Carrier Johnson (San Diego); Collins Woerman (Seattle); Decorum Design (Spokane); Design Naturale (Boise); Evans Design Firm (Kansas); Executive Director, Habitat for Humanity (N. Idaho); Holland Roth (Canada); JAD (South Korea); JC Interior Design Studio (Seattle); Jennifer Randall (Seattle); John Rovtar (Spokane); KDF (Yakima); Main Streeet Manager (Oregon); Myhre Group (Portland); Milieu (Spokane); NBBJ (Seattle); OMS (Spokane); San Diego State Capital Planning; Wagner Architects (Seattle); Weber Thompson (Seattle)

Contact Information

Jaime Rice
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Faculty

Nancy Blossom, Linda Johnson, Robert Krikac, Janetta McCoy, Matthew Melcher, Kathleen Ryan, Judith Theodorson and John Turpin.

ARCH

573 Ethics and Practice 3 Prereq graduate standing. Ethical and professional practice issues related to the business and practice of architecture; investigations into marketing client and business orientation.

DESGN

397 3-D Digital Modeling and Project Information Management I 3 Prereq I D 297. 3-D digital modeling as a medium to support design visualization, investigation and communication including project information management; emphasis on Revit suite software.

497 3-D Digital Modeling and Project Information Management II 3 Prereq Desgn 397. Integration of advanced building information modeling (BIM) techniques utilizing complex applications within the Revit software suite.

EDPSY

505 Research Methods I 3 Research methods; literature review; design, implementation, and interpretation of results.

Interior Design

I D

303 Immersion Studio 6 (1-10) Prereq A. A. degree, portfolio review, 203 year Interior Design degree. Intense and concentrated experience in design of interior spaces from abstraction and concept to complex interiors of larger scale.

305 Freehand Sketching 3 (2-2) Prereq Arch 101, I D 102. Development of knowledge and skills in freehand sketching to facilitate design exploration and further understanding of the built environment.

321 Interior Design Studio IV 4 (1-9) Prereq I D 203. Interior design problem-solving grounded in place theories.

325 Interior Building Systems 3 Prereq I D 203. Analysis, planning, and application of interior lighting; introduction to HVAC and plumbing systems.

326 Codes for Interior Designers 3 Prereq I D 203; certified major in interior design. Codes and specifications related to the design of the interior environment, including fire protection standards, accessibility, universal design and acoustics.

333 Interior Design Studio V 4 (1-9) Prereq I D 321. Interior design problem-solving grounded in organizational theories.

392 Professional Procedures 3 Business practices and procedures as related to interior design; contract documentation and specification writing.

415 Advanced Interior Construction and Detailing 3 Analysis of building construction and detailing which impacts interior space design.

425 Interior Design Studio VI 5 (0-10) Prereq I D 333. Interior design problem-solving integrating multidisciplinary theories within a community and/or global context.

426 Interior Design Studio VII 5 (0-10) Prereq I D 425. Interior design problem-solving grounded in selected theories.

460 Portfolio and Representation 3 Prereq I D 425. Develop communication skills and produce documents necessary to professionally present oneself to prospective employers within the fields of design.

520 Historical Perspectives of Interior Space 3 Prereq graduate standing. Historical perspectives of interior environments, spatial distributions, furnishings, and related design elements from ancient Egypt to the 18th century.

525 Interior Design Graduate Studio I 5 (0-10) Prereq I D 426. Graduate studio: application of advanced design theories, philosophies and research methodologies to enhance undergraduate design foundations through interdisciplinary studio experiences.

526 Interior Design Graduate Studio II 5 (0-10) Prereq I D 525. Graduate studio: individual thesis topics and the application of advanced design theories, philosophies, and research methodologies to studentâ™s focus topic.

530 Philosophies and Theories of the Built Environment 3 Prereq graduate standing in Arch/I D/L A. Same as Arch 530.

560 Interdisciplinary Seminar 3 Prereq graduate standing. Same as Arch 560.

594 Readings in Interior Design 3 Prereq graduate standing. Exploration of current topics through readings in interior design.

598 Topics in Interior Design V 1-3 May be repeated for credit; cumulative maximum 6 hours.

702 Masterâ™s Special Problems, Directed Study and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Landscape Architecture

Degree offered: Master of Science in Landscape Architecture

Faculty working with graduate students: 6

Graduate students: 10

Graduate students receiving assistantships or scholarships: 10%

Program offered: Pullman, Spokane

Tests required: IELTS, TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Program Description

The MSLA is offered by the Department of Horticulture and Landscape Architecture at WSU Pullman, and the Interdisciplinary Design Institute at WSU Spokane.The WSU Pullman program emphasizes the relationship between landscape architecture and environmental sciences and natural resources. The program at WSU Spokane is part of the Interdisciplinary Design Institute. The mission of The Institute is to advance knowledge to enhance the quality of people's lives in the built and natural environment. The MSLA Program emphasizes urban/suburban design, interdisciplinary design, and ecological design and planning. A Geographic Information Systems and Simulation Laboratory supports teaching, research, and service learning activities.

Degree Description

The Master of Science in Landscape Architecture provides students with a foundation in the theory and practice of landscape architecture. The MSLA program also provides students with the opportunity to focus on a particular area of landscape architectural investigation. The MSLA prepares students to achieve their professional goals in the private sector, academic settings, government, and other design and planning venues. The program focuses on advanced studies in landscape architecture and landscape planning within the geographical context of the Interior Northwest and the Northern Rocky Mountain Regions.

Training and Professional Development Opportunities

MSLA candidates have opportunities to receive training in design, digital and hand drawing, GIS, community and regional planning, natural resources management, undergraduate teaching.

Post-Graduate Employment Opportunities

MSLA graduates have opportunities to work in private landscape architecture firms (of all sizes), government and community entities (from small municipalities to the National Park Service), universities, multidisciplinary environmental consulting firms.

Post-Graduate Career Placements

Rainier National Park - forestry technician, Washington State DOT NW Region - landscape manager, design-build contractor - landscape design, municipal parks and

trails - design development manager, residential landscape firm - manager and designer.

Contact Information

MSLA Program Coordinator
Horticulture and Landscape Architecture
Washington State University
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E-mail: hortla@wsu.edu

Faculty

Kerry Brooks, Jolie Kaytes, Bob Scarfo, Ole Sleipness, Kenneth Struckmeyer and Phillip Waite.

Landscape Architecture

L A

520 **The Northern Rocky Mountain Regional Landscape** 4 (2-4) Prereq graduate standing. Biophysical characteristics of the Northern Rocky Mountain regional landscape.

521 **Cultural Interpretation of the Regional Landscape** 4 (2-4) Prereq graduate standing. Cultural characteristics of the Northern Rocky Mountain regional landscape.

530 **Philosophies and Theories of the Built Environment** 3 Prereq graduate standing in Arch/I D/L A. Same as Arch 530.

540 **Research Methods** 3 Same as Arch 540.

560 **Interdisciplinary Seminar** 3 Prereq graduate standing. Same as Arch 560.

600 **Special Projects or Independent Study** V 1 (0-3) to 18 (0-54) May be repeated for credit; cumulative maximum 100 hours.

700 **Master's Research, Thesis, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

Landscape Architecture

Degree offered: Master of Science in Landscape Architecture - Non Thesis

Program offered: Pullman, Spokane

Program Description

The MSLA is offered by the Department of Horticulture and Landscape Architecture at WSU Pullman, and the Interdisciplinary Design Institute at WSU Spokane.The WSU Pullman program emphasizes the relationship between landscape architecture and environmental sciences and natural resources. The program at WSU Spokane is part of the Interdisciplinary Design Institute. The mission of The Institute is to advance knowledge to enhance the quality of people's lives in the built and natural environment. The MSLA Program emphasizes urban/suburban design, interdisciplinary design, and ecological design and planning. A Geographic Information Systems and Simulation Laboratory supports teaching, research, and service learning activities.

Manufacturing Leadership - Cert in Manufacturing Leadership

Degree offered: Graduate Certificate in Manufacturing Leadership

Graduate students: 5

Program offered: DDP

Deadline: Fall: July 15 (January 10 international)
Spring: November 15 (July 1 international)
summer: April 1 (Default international)

Requirements

Students must apply for graduation for the certificate the final semester according to graduate school deadlines.

Program Description

The ETM Certificate Program allows students to complete shorter professional blocks of coursework relevant to their specific needs. Rather than completing all the course requirements for an ETM master's degree, students may take four courses (12-credit hours) in specialized areas. A certificate is awarded upon completion of these courses. Course credits earned for a certificate may also apply to a master's degree in the ETM Program or other graduate degree programs. A student may earn more than one certificate and may work on the certificate and master's program concurrently. Eight certificates are available in the Master of Engineering and Technology Management degree program.

Degree Description

Manufacturing and technical managers in today's manufacturing environments must demonstrate multifaceted leadership combined with a high level of technical expertise in order to compete in a world-class manufacturing arena. The four courses in this certificate provide a unique but essential foundation for understanding and optimizing a manufacturing organization. While many courses in manufacturing focus on the mechanical operations and processes, this certificate focuses on maximizing the performance of the entire system. Achieving the highest levels of performance starts with design of products and systems, integrating the contributions of a complex network of suppliers, and coordinating production according to key constraints throughout the supply chain. Finally, the most effective route to achieving continuous improvement in this environment is the integrated application of Lean, Six Sigma, and Theory of Constraints 1000 Character Limit.

Contact Information

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Engineering Management

E M

526 **Constraints Management** 3 Graduate-level counterpart of E M 426; additional requirements. Credit not granted for both E M 426 and 526.

560 **Integrated Supply Chain Management** 3 How technical managers analyze and manage the flow of materials, services, and information for products from inception to final customer.

575 **Performance Management in Technical Organizations** 3 Management of high technology organizations; planning, measurement, and human factors in improving high technology organizations; productivity, motivation and performance systems.

590 **Design for Product and Service Realization** 3 Prereq graduate standing. Same as E M 490; additional requirements. Credit not granted for both E M 490 and 590.

Materials Science

Degree offered: Doctor of Philosophy (Materials Science)

Faculty working with graduate students: 25

Graduate students: 26

Graduate students receiving assistantships or scholarships: 84%

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

no additional requirements.

Program Description

Washington State University (WSU) has the largest interdisciplinary doctoral program in Materials Science and Engineering in the Northwest. Since its establishment in the 1960s as the doctoral program in Chemical Physics and re-christening as the Materials Science program in the 1980s, it has evolved into a strongly collaborative, vibrant interdisciplinary program with the participation of faculty from several departments and schools in the College of Engineering and Architecture (CEA) and the College of Sciences (COS). This cross-disciplinary approach enables students to have access to a wide range of state-of-the-art research facilities from Mechanical, Materials, Civil, Chemical and Bio Engineering, as well as Physics and Chemistry. In addition, some of our faculty members have collaborations with the highly ranked Life Sciences programs (Plant Sciences, Veterinary Medicine and Agriculture) in WSU. More than 50% of our internationally renowned faculty members are fellows of their professional societies, and many have leadership roles in professional organizations, industrial consulting, and various federal government panels. Most of our students go on to work in academia, Fortune 500 companies and the national laboratories.

Degree Description

This program offers a PhD in Materials Science and Engineering.

Training and Professional Development Opportunities

None

Post-Graduate Employment Opportunities

None

Post-Graduate Career Placements

None

Contact Information

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Faculty

David Bahr, Amit Bandyopadhyay, Susmita Bose, James Brozik, Aurora Clark, Gary Collins, Susan Dexheimer, Indranath Dutta, Karl Englund, David Field, Yi Gu, Kerry Hipps, Mark Kuzyk, Jacob Leachman, Kelvin Lynn, Ursula Mazur, Matthew McCluskey, Jeanne McHale, Sinisa Mesarovic, M Norton, Louis Scudiero, Michael Wolcott, Hussein Zbib, Jinwen Zhang and Weihong Zhong.

Civil Engineering

C E

400 Highway Materials Engineering 3 (2-3) Prereq Engl 402; Math 360 or Math 370 or c//; senior standing; certified major in C E or instructor permission. Basic properties and mix designs of aggregates, asphalt, concrete and recycled materials; quality assurance, quality control.

401 Climate Change Science and Engineering 3 Prereq Chem 105; Math 172; Phys 201. Engineering solutions for climate change problems; basic science of climate change, engineering for mitigation and adaptation, and climate change policy.

402 Applied Meteorology 3 Prereq Math 172; Phys 201. Atmospheric physical behavior across spatial scales linking concepts of meteorological phenomena to engineering design principles. Credit not granted for both C E 402 and 502.

403 Air Quality Management 3 Prereq C E 402; Chem 105. Air pollution from the perspective of an environmental manager; regulatory framework, management strategies, monitoring, modeling tools, and control technologies. Credit not granted for both C E 403 and 503.

404 Sustainability Engineering I 3 Prereq senior standing in the College of Engineering and Architecture. Low impact development (stormwater), sustainable site selection, alternative transportation, heat island effect, light pollution and water use/efficiency. Credit not granted for both C E 404 and 504.

405 Sustainability Engineering II 3 Prereq senior standing in the College of Engineering and Architecture. Topics focusing on energy efficiency/use, regional and global climate/air issues, use/reuse of various material and resources and indoor environmental quality. Credit not granted for both C E 405 and 505.

414 Structural Design Laboratory 3 (2-3)) Prereq C E 330; Math 360 or Math 370 or c//; certified major in civil engineering or instructor permission. Senior lab requiring integration of previous course work into the execution of design projects and the assessment of experimental test data; design codes and standards, load determination, load path, influence lines; applications in concrete, masonry, steel, and wood.

415 Environmental Measurements 3 (1-6) Prereq C E 341; Engl 402; Math 360 or Math 370 or c//; certified major in C E or instructor permission. Theory and laboratory measurement techniques used in analyzing environmental quality parameters. Credit not granted for both C E 415 and 515.

416 Hydraulic Engineering Laboratory 3 (1-6) Prereq C E 315; Engl 402; Math 360 or Math 370 or c//; certified major in C E or instructor permission. Experiments related to fluid flow principles and their application to hydraulic engineering.

418 Hazardous Waste Engineering V 3-4 Prereq C E 341 with a C or better; certified major in C E or instructor permission. Hazardous waste properties, chemodynamics, and health effects; introduction to risk assessment and hazardous waste remediation. Credit not granted for both C E 418 and 518.

419 Hazardous Waste Treatment 3 Prereq C E 418 with a C or better; certified major in C E or instructor permission. Principles of operation and application of processes in design of technologies used in hazardous waste treatment and remediation. Credit not granted for both C E 419 and 519.

425 Soil and Site Improvement 3 Prereq C E 317 with a C or better; certified major in C E or instructor permission. Compaction theory and methods; deep densification of soils; advanced consolidation theory, preloading, vertical drains, chemical stabilization, grouting; design with geosynthetics. Credit not granted for both C E 425 and 525.

430 Analysis of Indeterminate Structures 3 Prereq C E 330 with a C or better; Math 220; E E 221; certified major in C E or instructor permission. Stiffness methods for the analysis of trusses, beams, and frames; matrix models; and computer applications.

431 Structural Steel Design 3 Prereq C E 330 with a C or better; certified major in C E or instructor permission. Design of steel structures by load and resistance factor design (LRFD); behavior and design of beams, columns, tension members and connections.

433 Reinforced Concrete Design 3 Prereq C E 330 with a C or better; certified major in C E or instructor permission. Behavior, analysis, and design of reinforced concrete structures; flexure; shear; bond; serviceability requirements; design of beams, columns, and slabs.

434 Prestressed Concrete and Reinforced Masonry Design 3 Prereq C E 433 with a C or better; certified major in C E or instructor permission. Behavior, analysis, and design of pretensioned and post-tensioned prestressed concrete structures; behavior and design of reinforced masonry structures. Credit not granted for both C E 434 and 534.

435 Foundations 3 Prereq C E 317 with a C or better; certified major in C E or instructor permission. Site investigation; bearing capacity, settlement and design of shallow foundations, piles and piers; design of retaining walls.

436 Design of Timber Structures 3 Prereq C E 330 with a C or better; certified major in C E or instructor permission. Engineering properties of wood materials; analysis and design of members, connections, trusses, shearwalls and structural diaphragms; durability and moisture effects on engineered wood products.

437 Structural Composites Design 3 Prereq C E 330. Behavior, analysis and design of fiber-reinforced plastic composite structures; micro, ply and laminate mechanics; reinforcement of concrete and wood.

442 Water and Wastewater Treatment Design 3 Prereq C E 341 with a C or better; certified major in engineering or environmental science. Water and wastewater treatment processes and design.

450 Hydraulic Engineering Design 3 Prereq C E 351 with a C or better; certified major in C E or instructor permission. Hydraulic design and planning of facilities associated with gravity controlled and pressurized flow.

451 Open Channel Flow 3 Prereq C E 351 with a C or better; certified major in C E or instructor permission. Steady, non-uniform flow; controls and transitions in fixed-bed channels. Credit not granted for both C E 451 and 551.

456 Sustainable Development in Water Resources 3 Prereq C or better in C E 351; certified civil engineering major. Sources of freshwater in Pacific Northwest; water demands; climate change impacts on water availability; approaches for developing sustainable water yield.

460 Advanced Hydrology 3 Prereq C E 351 with a C or better; certified major in C E or instructor permission. Components of the hydrologic cycle; conceptual models; watershed characteristics; probability/statistics in data analysis; hydrographs; computer models; and design applications. Credit not granted for both C E 460 and 560.

463 Engineering Administration 3 Engineering economy; annual cost, present worth, rate of return, and benefit-cost ratio in engineering decision making; basic contract law.

465 Integrated Civil Engineering Design 3 (1-6) Prereq senior in C E; taken final semester. Civil engineering applications to planning and design; problem synthesis, data analysis, decision making and reporting; design of complete projects that include local and world wide problems through interdisciplinary teams.

466 Fundamentals of Engineering Examination Review 1 Prereq certified engineering major; senior standing. Review of topics to prepare for the Fundamentals of Engineering Examination.

473 Pavement Design 3 Prereq C E 317; Econ 101 or 102; c// in C E 322. Pavement performance evaluation, material characterization, traffic analysis, pavement structural response analysis, transfer function application, and pavement design procedures for both flexible and rigid pavements.

474 Traffic Systems Design 3 (2-3) Prereq C E 322 or instructor permission. Analysis and design of network traffic systems, system evaluation using computer optimization and simulation; development and testing of alternative system design. Two lectures and one 3-hour lab a week; field data collection and field site visits.

475 Groundwater 3 (2-3) Prereq BSysE 351, C E 317 or Geol 315; and Math 140 or 172 or c//. Same as Geol 475.

480 Ethics and Professionalism 1 Prereq senior status; certified major in C E or instructor permission. Professional aspects of civil engineering.

495 Engineering Internship V 1 (0-3) to 4 (0-12) May be repeated for credit; cumulative maximum 4 hours. By interview only. Placement in a professional, governmental, or industrial situation for specialized or general experience.

498 Special Topics in Civil Engineering V 1-4 May be repeated for credit; cumulative maximum 6 hours. Contemporary topics in civil engineering.

499 Special Problems V 1 (0-3) to 4 (0-12) May be repeated for credit.

501 Advanced Topics in Transportation Engineering V 2-4 May be repeated for credit; cumulative maximum 9 hours. Prereq C E 322; statistics course. Special topics course in transportation engineering.

502 Applied Meteorology 3 Prereq Math 172; Phys 201. Graduate-level counterpart of C E 402; additional requirements. Credit not granted for both C E 402 and 502.

503 Air Quality Management 3 Graduate-level counterpart of C E 403; additional requirements. Credit not granted for both C E 403 and 503.

504 Sustainability Engineering I 3 Graduate-level counterpart of C E 404; additional requirements. Credit not granted for both C E 404 and 504.

505 Sustainability Engineering II 3 Graduate-level counterpart of C E 405; additional requirements. Credit not granted for both C E 405 and 505.

507 Seepage and Slope Stability 3 Principles governing the flow of water through soils; mechanics of stability analysis of slopes, landslides, and embankments for soil and rock masses; probabilistic analyses; stabilization methods. (Alt/even yrs, Spring only).

509 Numerical Modeling of Geomaterials 3 Prereq graduate student in geotechnical engineering or related field, or by interview. Modeling of the response of geomaterials to changes in imposed stresses or strains under both static and dynamic conditions.

510 Advanced Geomaterial Characterization 3 Advanced mechanics of geomaterials; compressibility, concept of stress and strain; shear strength, stress/strain and time-dependent behavior; dynamic properties.

511 Advanced Topics in Geotechnical Engineering V 2-4 May be repeated for credit; cumulative maximum 9 hours. Prereq C E 317. Soil dynamics, theoretical soil mechanics, numerical methods in soil mechanics, and geohydrology, engineering geology, cold regions geoengineering.

512 Dynamics of Structures 3 Equations of motion, free vibration, damping mechanisms, harmonic, impulse, and seismic loading; shock and seismic response spectra, time and frequency domain analysis, modal analysis, structural dynamics in building codes.

514 Advanced Mechanics of Materials 3 Elastic stress-strain relations, shear center, unsymmetrical bending, curved beams, elastic stability, elastically supported beams, energy methods, thin plates, shells.

515 Environmental Measurements 3 (1-6) Prereq C E 341; Engl 402; Math 360 or Math 370 or c//. Graduate-level counterpart of C E 415; additional requirements. Credit not granted for both C E 415 and 515.

517 Mechanics of Sediment Transport 3 Cohesive and non-cohesive sediments; initiation of sediment motion; sediment transport; suspended and bed load entrainment; models of sediment transport for alluvial and gravel bed streams, sediment-flow interaction; river morphology and ecological restoration.

518 Hazardous Waste Engineering V 3-4 Prereq graduate standing. Graduate-level counterpart of C E 418; additional requirements. Credit not granted for both C E 418 and 518.

519 Hazardous Waste Treatment 3 Prereq C E 518. Graduate-level counterpart of C E 419; additional requirements. Credit not granted for both C E 419 and 519.

524 Geotechnical Earthquake Engineering 3 Faulting and seismicity; site response analysis; probabilistic seismic hazard assessment; influence of soil on ground shaking; response spectra; soil liquefaction; seismic earth pressures; seismic slope stability; earthquake resistant design.

525 Soil and Site Improvement 3 Prereq C E 317. Graduate-level counterpart of C E 425; additional requirements. Credit not granted for both C E 425 and 525.

527 Engineering Properties of Soils 3 Prereq C E 317. Physical properties, compressibility and consolidation, shear strength, compaction, saturated and unsaturated soils, laboratory and field methods of measurement, relations of physical and engineering properties, introduction to critical-state soil mechanics.

528 Advanced Foundation Engineering 3 Prereq C E 317. Interpretation of in-situ tests for foundation design parameters, bearing capacity and settlement of axially loaded piles, pile groups, and drilled shafts, pile dynamics, laterally loaded deep foundations, downdrag and uplift of deep foundations, foundation load and integrity testing methods and data interpretation, mat foundations.

530 Advanced Design of Steel Structures 3 Prereq C E 431. Plate girder design; local and global buckling; plastic collapse analysis; shear and Moment-resisting connections; eccentrically-loaded connections.

531 Probability and Statistical Models in Engineering 3 Engineering applications of probability and statistics; Monte Carlo simulation; model estimation and testing; probabilistic characterizations of loads and material properties; risk and reliability analyses.

532 Finite Elements 3 Theory of finite elements; applications to general engineering systems considered as assemblages of discrete elements.

533 Advanced Reinforced Concrete Design 3 Prereq C E 433. Composite design; slab design; limit state design; footings; retaining walls; deep beams; brackets and corbels; torsion; seismic design; shear walls.

534 Prestressed Concrete and Reinforced Masonry Design 3 Graduate-level counterpart of C E 434; additional requirements. Credit not granted for both C E 434 and 534.

535 Advanced Finite Elements 3 Prereq graduate standing. Plate and shell analysis; nonlinear solution methods for finite strain/rotation and nonlinear materials.

536 Nondestructive Testing of Structural Materials 3 Principles of nondestructive testing applied to wood-based materials, steel, concrete, and masonry.

537 Advanced Topics in Structural Engineering 3 May be repeated for credit; cumulative maximum 9 hours. Elastic stability, plates and shells, other relevant topics.

538 Earthquake Engineering 3 Prereq C E 512. Seismology, size of earthquakes, seismic ground motion, seismic risk, behavior of structures subjected to earthquake loading seismic response spectra, seismic design codes, lateral force-resisting systems, detailing for inelastic seismic response.

539 Advanced Design of Timber Structures 3 Prereq CE 436. Engineering properties of wood materials; theory and design of wood composites, connections and load-sharing systems; performance criteria and durability.

540 Instrumental Analysis of Environmental Contaminants 3 (1-6) Prereq C E 415. Theory and methods of analysis of water and water suspensions for contaminants using electrometric, spectrophotometric, and chromatographic techniques.

541 Physicochemical Water and Wastewater Treatment 3 Prereq Math 315; rec C E 442. Principles of physical and chemical operations used in water and wastewater treatment, including chemical reactor theory, sedimentation, filtration, precipitation, mass transfer, coagulation/flocculation, disinfection, adsorption and ion exchange.

542 Biochemical Wastewater Treatment 3 Prereq C E 541. Principles of biochemical operations used in wastewater treatment including biochemical energetics, kinetics, activated sludge and fixed film reactors, nutrient removal, and sludge handling and treatment.

543 Advanced Topics in Environmental Engineering Practice V 1-4 May be repeated for credit; cumulative maximum 9 hours. Analysis and evaluation of air/water/soil pollution problems, new measurement methods, hazardous waste treatment, global climate change, and water/wastewater treatments.

549 Instrumentation and Measurements 3 (2-3) Prereq Math 172; Phys 102 or 202. Same as BSysE 541.

551 Open Channel Flow 3 Prereq C E 351. Graduate-level counterpart of C E 451; additional requirements. Credit not granted for both C E 451 and 551.

552 Advanced Topics in Hydraulic Engineering V 1-3 May be repeated for credit; cumulative maximum 9 hours. Prereq C E 315. Cavitation, air entrainment, hydraulic machinery, similitude, mixing in rivers and estuaries, hydraulic design.

555 Natural Treatment Systems 3 Prereq senior or graduate standing. Principles and design procedures of natural systems for wastewater treatment for agricultural and non-agricultural applications.

560 Advanced Hydrology 3 Prereq C E 351. Graduate-level counterpart of C E 460; additional requirements. Credit not granted for both C E 460 and 560.

566 Pavement Management and Rehabilitation 3 Prereq C E 322. Overview of Pavement Management Systems; PMS project and network levels; serviceability concepts and performance models; PMS data needs; rehabilitation and maintenance strategies; life cycle cost analysis; implementation of PMS in design, construction, maintenance, and research; examples of working PMS; maintenance and rehabilitation of asphalt and concrete pavements.

567 Properties of Highway Pavement Materials 3 Prereq C E 400 or instructor permission. Physical and mechanical properties of asphalt and Portland cement concrete materials; design of asphalt concrete mixes; introduction to viscoelastic theory; characterization methods, emphasizing fatigue, rutting, and thermal cracking; modification and upgrading techniques. Three 1-hr lect a wk and variable number of lab hrs for demonstration.

572 Advanced Pavement Design and Analysis 3 Prereq C E 473 or instructor permission. Design of new and rehabilitated asphalt and Portland Cement concrete pavements; mechanistic-empirical design procedures, performance models; deflection-based structural analysis, overlay design, environmental effect; long-term pavement performance (LTPP), and introduction to research topics in pavement engineering.

580 Graduate Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Lectures and reports on current developments in research and practice.

583 Aquatic Chemistry 3 Prereq C E 518. Chemical principles as applied to natural environmental system, water supply and pollution and control engineering.

584 Environmental Microbiology 3 Prereq graduate standing; instructor permission. Provides a fundamental understanding of microbiology to engineering and environmental science students; cell structure and metabolism; microbial ecology and diversity.

585 Aquatic System Restoration 3 Prereq Chem 345, C E 583; C E 581, MBioS 101. Study of natural, damaged and constructed ecosystems with emphasis on water quality protection and restoration of lakes, rivers, streams and wetlands.

586 Bioremediation of Hazardous Waste 3 Prereq C E 584. Applications of bioremediations to in situ subsurface treatment of hazardous waste; subsurface microbial degradation as related to microbial ecology.

588 Atmospheric Turbulence and Air Pollution Modeling 3 Prereq C E 571. Physical aspects of atmospheric turbulence, theoretical developments in atmospheric diffusion, and applied computer modeling with regulatory and research models.

589 Atmospheric Chemical and Physical Processes 3 Processes of removal of pollutants from the atmosphere; radical chain reactions, particle formation, model calculations.

590 Spectroscopy and Radiative Transfer of the Atmosphere 3 Prereq by interview only. Concepts of radiative transfer and molecular spectra in the troposphere and stratosphere with applications to trace gas measurements.

591 Aerosol Dynamics and Chemistry 3 Prereq graduate standing. Chemical and physical properties of atmospheric aerosols; sources, sinks, and transformation processes.

593 Polymer Materials and Engineering 3 Prereq MSE 402. Preparation and structure-property relationship of polymer materials with emphasis on fracture mechanics and toughening.

594 Natural Fibers 3 Prereq graduate standing. Structural aspects and properties of natural fibers including anatomy, ultrastructure, and chemistry.

595 Polymer and Composite Processing 3 Prereq graduate standing. Polymer and composite processing from fundamental principles to practical applications.

596 Engineered Wood Composites 3 Prereq graduate standing. Theory and practice of wood composite materials, manufacture and development.

597 Polymers and Surfaces for Adhesion 3 Prereq MSE 402 or 404. Physical chemistry of polymers and surfaces needed to understand interface morphology, adhesion mechanisms and bond performance.

598 Natural Fiber Polymer Composites 3 Prereq graduate standing. Fundamentals, development and application of composite materials produced from polymers reinforced with natural fibers and wood as major components.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

CH E

432 Chemical Engineering Lab I 3 (1-6) Prereq Ch E 310, 321, 332, 334. Statistical design and analysis of experiments; safety; experiments in heat and mass transfer; separations, other unit operations, kinetics, control; technical reports and presentations.

433 Chemical Engineering Lab II 2 (0-6) May be repeated for credit; cumulative maximum 4 hours. Prereq Ch E 432. Laboratory experiments in heat and mass transfer; separations, other unit operations, kinetics, control; design calculations; technical reports and presentations.

441 Process Control 3 Prereq Ch E 211 or Ch E 310. Measuring instruments, automatic control, process and instrument characteristics and theory applied to industrial control problems.

450 Chemical Process Analysis and Design I 3 Prereq Ch E 301, 321, 334. Chemical engineering design; computer tools; safety and environmental constraints; cost and equipment optimization.

451 Chemical Process Analysis and Design II 3 Prereq Ch E 450. Development, design, and economic evaluation of chemical and related processes as practiced in industry.

461 Introduction to Nuclear Engineering 3 Prereq junior or senior standing in engineering or physical sciences; Math 315 or equivalent. Same as M E 461.

465 Integrated Envirochemical Engineering 3 Prereq Ch E 334. Application of chemical engineering principles in assessment and remediation of industrial problems in air pollution, water pollution, and solid and hazardous waste.

475 Introduction to Biochemical Engineering 3 Prereq Ch E 310, 332. Application of chemical engineering principles to the processing of biological and biochemical materials.

476 Biomedical Engineering Principles 3 Prereq Ch E 301, 310. The application of chemical engineering principles to biomedical processes.

481 Special Topics in Chemical Engineering V 1-3 Interfacial phenomena, high temperature material processing, integrated circuit manufacturing, in situ destruction of hazardous waste.

495 Chemical Engineering Internship 2 (0-6) May be repeated for credit; cumulative maximum 4 hours. Students work full time in engineering assignments in approved industries with prior approval of advisor and industrial supervisor.

498 Technical Seminar 1 May be repeated for credit; cumulative maximum 2 hours. For juniors and seniors in Ch E.

499 Special Problems V 1 (0-3) to 4 (0-12) May be repeated for credit.

510 Transport Processes 3 Transport of mass, energy, and momentum; unsteady and steady states as applied to chemical processing; macroscopic and microscopic analyses.

527 Macroscopic Thermodynamics 3 Same as M E 527.

529 Chemical Engineering Kinetics 3 Interpretation of kinetic data and design of nonideal chemical reactors; fundamentals of heterogeneous catalysis, catalyst preparation, characterization, and theory.

541 Chemical Engineering Analysis 3 Mathematical analysis of chemical engineering operations and processes; mathematical modeling and computer application.

549 Biochemical Conversion Laboratory 2 (1-3) Prereq graduate standing in engineering. Analytical techniques in biomass characterization; bioproduct/biofuel production from renewable biomass including biochemical processes.

560 Biochemical Engineering 3 Chemical engineering applied to biological systems; fermentation processes, biochemical reactor design, downstream processing, transport phenomena in biological systems, biochemical technology.

574 Protein Biotechnology 3 Same as MBioS 574.

581 Advanced Topics in Chemical Engineering V 1-3 May be repeated for credit; cumulative maximum 9 hours. Filtration, reaction engineering, two-phase flow, non-Newtonian fluids, interfacial phenomena, fluidization, novel separations, biomedical engineering.

585 Interfacial Phenomena 3 Prereq Ch E 301; Ch E 310; graduate standing. Chemical and physical nature of the interface including the molecular basis for interfacial forces and resulting macroscopic phenomena.

596 Research Methods and Presentation I 2 Prereq graduate standing. Establish sound practices for graduate research and presentation of results; techniques used for performing through literature searching and establishing and testing research hypotheses.

597 Research Methods and Presentation II 2 Prereq graduate standing. Establishing sound practices for presentation of research programs and research results.

598 Research Seminar 1 May be repeated for credit. Seminar presentations on current topics in chemical engineering research.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Civil Engineering

CHEM

401 Modern Inorganic Chemistry 3 Prereq Chem 332 with a grade of C or better or c//. Properties of substances; periodic systems; oxidation-reduction and acid-base characteristics interpreted on the basis of atomic and molecular structure.

410 Advanced Synthesis and Characterization 3 (1-6) Prereq Chem 346 or 348, and Chem 332 each with a grade of C or better. Synthesis and characterization of organic and inorganic compounds and solid-state materials; modern synthetic technology, characterization methods, and laboratory techniques.

425 Quantitative Instrumental Analysis 2 Prereq Chem 332 or 336 with a grade of C or better or c//. Computer interfacing applicable to chemical instrumentation; principles and applications of modern chromatography, spectrophotometry and electrochemical techniques.

426 Quantitative Instrumental Analysis Laboratory 2 (0-6) Prereq Chem 425 with a grade of C or better or c//. Laboratory experience in modern analytical methods.

480 Solid State Chemistry 3 Prereq Chem 332 with a grade of C or better. Properties, bonding and synthesis of solid state material; crystalline and amorphous solids and coatings.

490 Current Topics in Chemistry V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq consent of instructor. Recent advances in the understanding and application of chemical systems.

495 Directed Research 1 Prereq permission of instructor. Poster presentation of final research project.

499 Special Problems V 1 (0-3) to 4 (0-12) May be repeated for credit.

501 Advanced Inorganic Chemistry I 3 Periodic table survey, typical compounds and their reactivity; models and reactivity, acid-base, oxidation-reduction, and electronic structure contributions.

503 Advanced Topics in Inorganic Chemistry V 1-3 May be repeated for credit. Recent significant developments.

509 Chemical Group Theory 3 Mathematical definitions of groups and representations, applications to chemical structure and spectra, ligand field theory, chemical reactions and selection rules.

510 Introduction to Proteomics 2 Prereq graduate standing or permission of the instructor; introductory biochemistry, MBioS 303 or equivalent. Techniques and applications for the analysis of the proteome.

512 Bioanalysis 2 Methods for the measurement of biological compounds.

514 Mass Spectrometry 2 Prereq Chem 425. Current methods, techniques and interpretation of mass spectrometric analysis.

517 Chromatography 2 Prereq Chem 425.

518 Electrochemistry 2 Prereq Chem 425.

520 Advanced Analytical Chemistry 3 Prereq Chem 425. Statistics in chemical analysis; sampling; control of contamination and losses in analysis; electrochemical methods; separation in analysis; spectroscopic techniques.

521 Radiochemistry and Radiotracers 2 Prereq Chem 331 with a grade of C or better. Graduate-level counterpart of Chem 421; additional requirements. Credit not granted for both Chem 421 and 521.

522 Radiochemistry Laboratory 1 (0-3) Prereq Chem 222, 331; Phys 202 each with a grade of C or better. Graduate-level counterpart of Chem 422; additional requirements. Credit not granted for both Chem 422 and 522.

527 **Environmental Chemistry** 2 Natural water chemistry, Agri processes, kinetics, thermodynamics, modeling in lake, river, and sea water.

529 **Selected Topics in Analytical Chemistry** V 1-3 May be repeated for credit. Selected current developments.

531 **Advanced Physical Chemistry I** 3 Prereq Chem 331. Classical physical chemistry including basic thermodynamics and kinetics; an introductory discussion of surface chemistry and electrochemistry.

532 **Advanced Physical Chemistry II** 3 Prereq Chem 332. Introduction to quantum mechanics; postulates of quantum mechanics; exact solutions and approximation methods.

534 **Chemical Statistical Mechanics** 3 Statistical theory of thermodynamic variables and chemical equilibrium; calculation of equilibrium properties from spectral data; fluctuations about equilibrium; quantum statistics.

536 **Quantum Chemistry** 3 Prereq Chem 532 or equivalent. Quantum mechanics applied to chemical problems: states of atoms and molecules, transitions and spectra, ladder operators and many electron methods.

537 **Advanced Topics in Physical Chemistry** V 1-3 May be repeated for credit. Selected subjects; irreversible thermodynamics; chemical bonding; NMR; ligand field theory; x-ray diffraction; neutron diffraction.

540 **Physical Organic Chemistry** 3 The major classes of organic reaction mechanisms and their significance; kinetics and introductory theory.

542 **Advanced Organic Chemistry** 3 Synthesis of organic compounds; recent developments from current literature.

543 **Bioorganic Chemistry** 3 Chemistry of biological systems, medicinal chemistry, protein chemistry, enzyme mechanisms and inhibitors.

544 **Advanced Topics in Organic Chemistry** V 1-3 May be repeated for credit. Current research in organic chemistry.

545 **Synthetic Organic Chemistry** 3 Modern synthetic methods and strategies; detailed reaction mechanisms, reaction scope and issues in catalysis will be discussed.

546 **Spectroscopic Identification of Organic Compounds** 3 Structural interpretation of mass spectrometry and IR, UV-VIS and NMR spectrometry of small molecule organic compounds.

550 **Special Topics in Nuclear Processes and Radioactive Waste Management** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq permission of instructor. Fundamental chemistry of the nuclear industry, chemical processing and waste management.

555 **Teaching Chemistry** 1 Teaching chemistry; workshops for new graduate teaching assistants in chemistry focusing on tutorials and labs.

564 **Molecular Phenomena** 3 Phenomena which yield information on structures, energy levels, and interactions of molecules in solid, liquid, and gaseous phases.

581 **Environmental Chemistry I** 3 Prereq graduate standing. Chemistry of natural and pollutant species and their reactions in the atmospheric environment.

590 **Introduction to Research Topics** 1 Presentation and description of research areas and projects of current interest to faculty.

592 **Seminar in Analytical Chemistry** 1 May be repeated for credit; cumulative maximum 6 hours. Presentation and discussion of topics in analytical chemistry taken from research in progress or current literature.

593 **Seminar in Physical Chemistry** 1 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing. Presentation and discussion of topics in physical chemistry and materials science taken from research in progress or current literature.

594 **Seminar in Organic Chemistry** 1 May be repeated for credit; cumulative maximum 6 hours. Presentation and discussion of topics in organic chemistry taken from research in progress or current literature.

600 **Special Projects or Independent Study** V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 **Master's Research, Thesis, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 **Master's Special Problems, Directed Study, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 **Doctoral Research, Dissertation, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

Mechanical Engineering

M E

401 **Mechatronics** 3 (2-3) Prereq E E 304; M E 348 Integration of mechanical and microprocessor-based systems; control theory implemented with data acquisition systems; sensors; actuators, signal conditioning, programmable logic controllers.

402 **Thermal Systems Design** 3 Prereq M E 404, major in engineering. Design and analysis of thermofluid systems using principles of thermodynamics, fluid mechanics and heat transfer.

404 **Heat Transfer** 3 Prereq M E 301, 303 or c//, major in engineering. Conduction, radiation, and convection heat transfer; analytical, numerical, experimental results for solids, liquids, and gases; heat exchanger design.

406 **Experimental Design** 3 (1-6) Prereq M E 305, 316, 404; Rec M E 348. Designing, conducting, and reporting of experimental investigations involving mechanical equipment.

407 **Computational Fluid Dynamics** 3 Prereq M E 303. Basic concepts and applications of computational fluid dynamics to the analysis and design of fluid systems and components.

413 **Mechanics of Solids** 3 Prereq C E 215, MSE 201. Same as MSE 413.

414 **Machine Design** 3 Prereq C E 215, M E 316 or c//; major in engineering; rec M E 220. Optimal design of machinery; analysis for prevention of machine elements failure.

416 **Mechanical Systems Design** 3 (1-6) Prereq M E 348 or 375; M E 404; M E 414 or c//. Integrative design in mechanical engineering; multidisciplinary design project considering both technical and non-technical contexts; organizational dynamics and communications.

419 **Air Conditioning** 3 Prereq M E 404. Principles of heat and moisture transfer; air motion and purity in buildings; design of systems.

431 **Design of Solar Thermal Systems** 3 Prereq ME 301, 303, 404 and certified major in engineering or architecture. Design of solar thermal systems for heating and cooling of buildings, heating of water, electrical generation, industrial processes and distillation.

436 **Combustion Engines** 3 Prereq M E 303. Internal combustion engines; spark ignition engines, diesels, and gas turbines.

439 Applied Aerodynamics 3 Prereq M E 303. Aerodynamic lift and drag; circulation; boundary layers, application to subsonic aircraft wing design.

449 Mechanical Vibration 3 Prereq M E 348. Vibrating systems and noise producing mechanisms; design for noise and vibration control.

461 Introduction to Nuclear Engineering 3 Prereq junior or senior standing in engineering or physical sciences; Math 315 or equivalent. Applied nuclear physics; application to the nuclear fuel cycle and nuclear reactor core design; nuclear reactor systems and safety.

472 Finite Element Methods in Design 3 Prereq M E 414. Design of selected mechanical systems components using finite element analysis.

473 Advanced CAD and Geometric Modeling 3 (2-3) Prereq M E 316. Parametric and feature based CAD/CAM; geometric modeling and its mathematical basis; integration of CAD with design processes and other software.

474 Design for Manufacture and Modern Manufacturing Strategies 3 Prereq M E 310. Design for manufacture and assembly; modern manufacturing philosophies and practices; lean manufacturing; manufacturing cost and time analysis; quality control.

475 Manufacturing Enterprise Systems -- Automation and Product Realization 3 (2-3) Prereq MME computer programming course; M E 316. Manufacturing automation and product realization; role of information technology and electronic data in manufacturing enterprise systems; product life-cycle management (PLM) and related tools and processes; sustainable and green manufacturing.

481 Control Systems 3 Prereq M E 348. Analysis and design of feedback control systems.

483 Topics in Mechanical Engineering V 1 (0-4) to 4 (0-12) May be repeated for credit; cumulative maximum 7 hours. Contemporary topics in materials engineering.

495 Internship in Mechanical Industry 3 or 6 May be repeated for credit; cumulative maximum 12 hours. Prereq major in materials science engineering or mechanical engineering. By interview only. Students work full time on engineering assignment in approved industries with industrial and faculty supervision.

499 Special Problems V 1 (0-3) to 4 (0-12) May be repeated for credit.

501 Continuum Mechanics 3 Prereq graduate standing. Unified presentation of principles common to all branches of solid and fluid mechanics; viscous fluids, elasticity, viscoelasticity, and plasticity.

503 Systems Design Approaches for Sustainability 3 Prereq graduate standing. Sustainability in systems design methodologies; systems modeling and decision-making for sustainability; multidisciplinary design optimization; research topics.

509 MEMS Engineering 3 (2-3) Prereq graduate standing or permission of instructor. Introduction to the design, fabrication and application of microelectromechanical systems.

513 Crystal Plasticity 3 Prereq Math 440. Same as MSE 513.

514 Thermodynamics of Solids 3 Same as MSE 514.

515 Advanced Heat Transfer 3 Derivation of the energy conservation equation; laminar and turbulent forced convection heat transfer with internal and external flow; free convection.

516 Conduction and Radiation Heat Transfer 3 Prereq M E 404. Principles of conduction and radiation heat transfer with focus on solving conduction and radiation problems of engineering interest.

517 Thin Films 3 Prereq graduate standing or senior in engineering or science. Same as MSE 517.

520 Multiscale Modeling in Thermomechanics of Materials 3 Prereq graduate standing or permission of instructor. Multiscale problems in thermomechanics of materials; practical and computational aspects of homogenization, granular materials, dislocation plasticity and atomistic methods.

521 Fundamentals of Fluids I 3 Prereq C E 315 or M E 303. Governing equations of fluid mechanics accompanied by applications of Navier-Stokes equation to simple flow situations, boundary layer analysis.

523 Engineering Acoustics 3 Prereq graduate standing. Fundamentals of acoustics including wave theory; transmission through layers; generation and reception, low frequency models; application to sound measurement, transducers, loudspeaker cabinet design, and nondestructive testing; acoustic design project required.

525 Biomechanics 3 Prereq B E 320, C E 215 or MSE 301; Math 315. Same as B E 525.

527 Macroscopic Thermodynamics 3 Advanced thermodynamics from macroscopic viewpoint; basic postulates, equilibrium, stability, property relations; application to thermal-fluid and solid mechanics; irreversible thermodynamics.

530 Elasticity 3 Prereq M E 414; graduate standing. Theory of kinematics of solid deformable bodies; conservation laws applied to an elastic continuum; generalized linear stress-strain behavior with applications.

531 Theory of Plasticity 3 The fundamentals of the theory of plasticity; the classical theory of plasticity; the classical theory and modern continuum theories of large elasto-plastic deformations.

532 Finite Elements 3 Same as C E 532.

534 Mechanics of Composite Materials 3 Prereq M E 414. Analysis of micromechanical and macromechanical behavior of composite materials with emphasis on fiber-reinforced composite; prediction of properties; stiffness and strength theories; laminated beams and plates; dynamic behavior; environmental effects.

537 Fracture Mechanics and Mechanisms 3 Same as MSE 537.

540 Advanced Dynamics of Physical Systems 3 Newtonian dynamics, rotating coordinate systems; Lagrangian and Hamiltonian mechanics; gyroscopic mechanics, other applications.

556 Numerical Modeling in Fluid Mechanics 3 Prereq C E 315. Fundamental concepts in development of numerical models for fluid flow with applications to steady and unsteady flows.

565 Nuclear Reactor Engineering 3 Prereq M E 461. Reactor power distribution; thermal and exposure limits; critical heat flux and pressure design; neutronic/thermal hydraulic relationships; transient/accident analysis.

574 Foundations of CAD 3 Topics fundamental to the creation of CAD, engineering visualization, and virtual reality based engineering software.

575 Geometric Modeling 3 Study of the mathematics behind the creation of complex shapes for CAD using curves, surfaces, and solids.

579 Advanced Topics in Mechanical Engineering V 1-3 May be repeated for credit.

598 Seminar 1 May be repeated for credit. Current research interests.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Mechanical Engineering

MAT S

503 Current Topics in Materials Science V 1-3 May be repeated for credit. Recent advances and current research at the forefront of materials science.

505 Advanced Materials Science 3 Same as MSE 505.

506 Biomaterials 3 Prereq MSE 201 and permission of instructor. Same as MSE 506.

513 Crystal Plasticity 3 Same as MSE 513.

516 Phase Transformations 3 Same as MSE 516.

521 Statistics of Microstructures 3 Prereq Math 440, 540 or permission of instructor. Same as MSE 521.

538 Special Topics V 1-3 May be repeated for credit. Selected topics of current interest in advanced materials science.

571 Microscopic Analysis of Solid Surfaces 3 Modern spectroscopic methods for microscopic analysis of solid surfaces; emphasizes electron, ion, laser, and x-ray techniques.

593 Seminar in Materials Science 1 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing. Presentation and discussion of topics in materials science taken from research in progress or current literature.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Mechanical Engineering

MATH

401 Introduction to Analysis I 3 Prereq Math 301 with a grade of C or better. Properties of sets and sequences of real numbers; limits, continuity, differentiation and integration of functions; metric spaces.

402 Introduction to Analysis II 3 Prereq Math 401. Sequences of functions, power series, multivariable calculus, inverse and implicit function theorems, Lagrange multipliers, change of variable in multiple integrations.

415 Intermediate Differential Equations 3 Prereq Math 315. Linear systems; qualitative theory (existence, uniqueness, stability, periodicity); boundary value problems; applications.

416 Simulation Methods 3 Prereq Math 360 and a computer programming course. Model formulation and simulation in business, industry, and government; simulation languages; analysis of simulation output; applications. Credit not granted for both Math 416 and 516.

420 Linear Algebra 3 Prereq Math 220 or 230, and Math 301 with grades of C or better. Advanced topics in linear algebra including similarity transformations, canonical forms, bilinear forms.

421 Algebraic Structures 3 Prereq Math 301 with a grade of C or better. Properties of algebraic structures and their homomorphisms, semi-groups, groups, rings, unique factorization domains, fields.

423 Statistical Methods for Engineers and Scientists 3 Prereq Stat 360 or one 3 hour statistics course. Same as Stat 423.

425 Conceptual Aspects of Mathematics 3 Prereq college-level math course. Same as T & L 425.

431 Intersections of Culture and Mathematics 3 (2-2) Prereq Math 301. Gender/race/ethnicity differences; social consequences; cultural influences on development and learning of mathematics; role of women, people of color in mathematics. Credit not granted for both Math 431 and 531.

432 Mathematics for College and Secondary Teachers 3 Prereq Math 301. Pre-algebra, algebra functions and geometry examined from an advanced perspective, for secondary and lower level college teachers. Credit not granted for both Math 432 and 532.

440 Applied Mathematics I 3 Prereq Math 315. Partial differential equations; Fourier series and integrals; Bessel functions; calculus of variations; vector calculus; applications. Credit not granted for both Math 440 and 540.

441 Applied Mathematics II 3 Prereq Math 315. Complex variable theory including analytic functions, infinite series, residues, and conformal mapping; Laplace transforms; applications. Credit not granted for both Math 441 and 541.

443 Applied Probability 3 Prereq Math 172; 220. Same as Stat 443.

448 Numerical Analysis 3 Prereq FORTRAN, C, or other programming language; Math 315. Fundamentals of numerical computation; finding zeroes of functions, approximation and interpolation; numerical integration (quadrature); numerical solution of ordinary differential equations. Credit not granted for both Math 448 and 548.

453 Graph Theory 3 Prereq Math 220. Graphs and their applications, directed graphs, trees, networks, Eulerian and Hamiltonian paths, matrix representations, construction of algorithms. Credit not granted for both Math 453 and 553.

456 Introduction to Statistical Theory 3 Prereq Stat 430 or 443. Same as Stat 456.

464 Linear Optimization 3 Prereq Math 273. Linear and integer programming; optimization problems; applications to economic and military strategies; rectangular games; minimax theory.

466 Optimization in Networks 3 Prereq Math 325 or 364, or knowledge of linear programming. Formulation and solution of network optimization problems including shortest path, maximal flow, minimum cost flow, assignment, covering, postman, and salesman. Credit not granted for both Math 466 and 566.

486 Mathematical Modeling in the Natural Science 3 Prereq Math 315. Development of mathematical models for solutions of problems in the physical and life sciences. Credit not granted for both Math 486 and 586

490 Topics in Mathematics V 1-3 Prereq permission of instructor. Special topics in mathematics.

494 Seminar in Mathematical Biology 1 May be repeated for credit; cumulative maximum 4 hours. Prereq one course in math and one course in biology. Oral presentation of research approaches, research results and literature review of mathematical biology including mathematical modeling of biological systems.

497 Instructional Practicum 1 or 2 May be repeated for credit; cumulative maximum 2 hours. By interview only. May be repeated for credit; cumulative maximum 2 hours.

499 **Special Problems** V 1 (0-3) to 4 (0-12) May be repeated for credit.

500 **Proseminar** 1 May be repeated for credit; cumulative maximum 2 hours.

501 **Real Analysis** 3 Prereq Math 402. Metric spaces, convergence, continuous functions, infinite series, differentiation and integration of functions of one and several variables.

502 **Introduction to Functional Analysis** 3 Prereq Math 420, 501. Normed linear spaces, Banach spaces, introduction to Hilbert space, linear operators.

503 **Complex Analysis** 3 Prereq Math 501. Analytic functions, complex integration, Taylor and Laurent series, conformal mapping, Riemann surfaces and analytic continuation.

504 **Measure and Integration** 3 Prereq Math 501. Lebesque measure, Lebesque integration, differentiation, L spaces, general measure and integration, Radon-Nikodym Theorem, outer measure and product measures.

505 **Abstract Algebra** 3 Prereq Math 421. Groups, rings, fields, and homological algebra.

507 **Advanced Theory of Numbers** 3 May be repeated for credit; cumulative maximum 6 hours. Analytic and algebraic number theory.

508 **Topics in Applied Analysis** 3 Prereq Math 502. Advanced treatment of applications using techniques from fundamental analysis, convexity, analytic function theory, asymptotics, and differential equations.

511 **Advanced Linear Algebra** 3 Prereq Math 420. Vector spaces, inner products, unitary equivalence, similarity, Jordan forms, normality, spectral theory, singular value decomposition, norms and inequalities.

512 **Ordinary Differential Equations** 3 Prereq Math 402. Existence of solutions; linear systems; qualitative behavior, especially stability; periodic solutions.

516 **Simulation Methods** 3 Prereq Math 360 and a computer programming course. Graduate-level counterpart of Math 416; additional requirements. Credit not granted for both Math 416 and 516.

525 **General Topology** 3 Prereq Math 402. Sets, metric spaces, topological spaces; continuous mappings, compactness, connectedness, local properties, function spaces, and fundamental groups.

531 **Intersections of Culture and Mathematics** 3 (2-2) Graduate-level counterpart of Math 431; additional requirements. Credit not granted for both Math 431 and 531.

532 **Mathematics for College and Secondary Teachers** 3 Prereq graduate standing, teaching experience or intention. Graduate-level counterpart of Math 432; additional requirements. Credit not granted for both Math 432 and 532.

533 **Teaching College Mathematics** 1 May be repeated for credit; cumulative maximum 3 hours. Prereq graduate standing in mathematics. Theory and practice of mathematics instruction at the collegiate level.

541 **Applied Mathematics II** 3 Prereq Math 315, graduate standing. Graduate-level counterpart of Math 441; additional requirements. Credit not granted for both Math 441 and 541.

543 **Approximation Theory** 3 Prereq Math 448. Univariate polynomial and rational approximation techniques; approximation using splines and wavelets; selected topics in multivariate approximation; algorithms for approximation.

544 **Advanced Matrix Computations** 3 Prereq Math 448. Advanced topics in the solution of linear systems and eigenvalue problems, including parallel matrix computations.

545 **Numerical Analysis of Evolution Equations** 3 Prereq Math 448. Discretization and numerical solution of partial differential equations of evolution; stability, consistency, and convergence; shocks; conservation of forms.

546 **Numerical Analysis of Elliptic PDEs** 3 Prereq Math 448. Methods of discretizing elliptic partial differential equations and solving the resulting systems of equations; error analysis.

548 **Numerical Analysis** 3 Prereq FORTRAN, C, or other programming language; Math 315; graduate standing. Graduate-level counterpart of Math 448; additional requirements. Credit not granted for both Math 448 and 548.

553 **Graph Theory** 3 Prereq Math 220; graduate standing. Graduate-level counterpart of Math 453; additional requirements. Credit not granted for both Math 453 and 553.

555 **Topics in Combinatorics** 3 May be repeated for credit; cumulative maximum 6 hours. Combinatorics, generating functions, recurrence relations, inclusion-exclusion, coding theory; experimental design, graph theory.

560 **Partial Differential Equations I** 3 Prereq Math 402. Partial differential equations and other functional equations: general theory, methods of solution, applications.

561 **Partial Differential Equations II** 3 Prereq Math 560. Continuation of Math 560.

563 **Mathematical Genetics** 3 Prereq graduate standing. Mathematical approaches to population genetics and genome analysis; theories and statistical analyses of genetic parameters.

564 **Nonlinear Optimization I** 3 Prereq advanced multivariate calculus and a programming language; Rec Math 464, 544. Theory and algorithms for unconstrained nonlinear optimization problems, including line search, trust region, conjugate gradient, Newton and quasi-Newton methods.

565 **Nonlinear Optimization II** 3 Prereq Math 273, 564; programming language. Theory and algorithms for constrained linear and nonlinear optimization including interior point, quadratic programming, penalty, barrier and augmented Lagrangian methods.

566 **Optimization in Networks** 3 Prereq graduate standing; Math 325 or 364, or knowledge of linear programming. Graduate-level counterpart of Math 466; additional requirements. Credit not granted for both Math 466 and 566.

567 **Integer and Combinatorial Optimization** 3 Prereq Math 464. Theory and applications of integer and combinatorial optimization including enumerative, cutting plane, basis reduction, relaxation and matching methods.

568 **Statistical Theory I** 3 Prereq Math 273; Stat 430 or 443. Same as Stat 548.

569 **Statistical Theory II** 3 Prereq Stat 548. Same as Stat 549.

570 **Mathematical Foundations of Continuum Mechanics I** 3 Prereq advanced calculus and differential equations. The basic mathematical theory of continuum mechanics and its relation to perturbation techniques and stability methods.

571 **Mathematical Foundations of Continuum Mechanics II** 3 Prereq Math 570. Continuation of Math 570.

574 **Topics in Optimization** 3 May be repeated for credit; cumulative maximum 12 hours. Prereq advanced multivariable calculus and a programming language. Advanced topics in the theory and computing methodology in optimization with emphasis on real-life algorithmic implementations.

581 Seminar in Mathematics V 1-3 May be repeated for credit.

583 Seminar in Applied Mathematics V 1-3 May be repeated for credit.

586 Mathematical Modeling in the Natural Science 3 Prereq Math 315. Graduate-level counterpart of Math 486; additional requirements. Credit not granted for both Math 486 and 586

590 Seminar in Mathematics Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing. Topics in mathematics education.

597 Mathematics Instruction Seminar 1 May be repeated for credit; cumulative maximum 5 hours. Prereq graduate standing. Introduction to the teaching of university mathematics.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Mechanical Engineering

MATH

540 Applied Mathematics I 3 Prereq Math 315, graduate standing. Graduate-level counterpart of Math 440; additional requirements. Credit not granted for both Math 440 and 540.

Materials Science And Engineering

MSE

401 Metallic Materials 3 Prereq MSE 201. Major alloy systems and manufacturing processes; materials selection.

402 Polymeric Materials 3 Prereq MSE 201. Structural characterization, syntheses, and reactions of polymeric materials; relationships between structure and properties, viscoelasticity, deformation, and physical behavior of polymers.

403 Ceramic Materials 3 Prereq MSE 201. Processing, characteristics, microstructure, and properties of ceramic materials.

404 Engineering Composites 3 Prereq MSE 201. Basic concept in design and specifications of engineering composites.

406 Biomaterials 3 Prereq MSE 201. Overview of the different types of materials used in biomedical applications such as implants and medical devices. Credit not granted for both MSE 406 and 506.

413 Mechanics of Solids 3 Prereq C E 215, MSE 201. Elasticity, elastic stress distributions; plastic deformation of single and polycrystals; introduction to dislocation theory and its applications; creep, fracture, fatigue.

425 Senior Thesis I 2 (0-6) Prereq MSE 320, 323, senior in materials science engineering. Research in materials science and engineering.

426 Senior Thesis II 2 (0-6) Prereq MSE 320, 323, senior in materials science engineering. Research in materials science and engineering.

440 Materials: The Foundations of Society and Technology 3 Prereq completion of one Tier I and three Tier II courses. History of materials; role that materials have played in human development; modern societal, technological, and economic impact of materials.

483 Topics in Materials Engineering V 1 (0-4) to 4 (0-12) May be repeated for credit; cumulative maximum 7 hours. Contemporary topics in materials engineering.

499 Special Problems V 1 (0-3) to 4 (0-12) May be repeated for credit.

503 Advanced Topics in Materials Engineering V 1-3 May be repeated for credit; cumulative maximum 6 hours.

505 Advanced Materials Science 3 Broad baseline in materials science including relationships between structure and properties.

506 Biomaterials 3 Prereq MSE 201 and permission of instructor. Graduate-level counterpart of MSE 406; additional requirements. Credit not granted for both MSE 406 and 506.

508 Polymer Nanocomposites and Functionalities 3 Prereq MSE 402 or 404 rec. Structures, properties, fabrication and applications of nano-scale material and their polymer nanocomposites; functionalities including flame retardant, electrically, thermal and damping properties.

509 MEMS Engineering 3 (2-3) Prereq graduate standing. Same as M E 509.

513 Crystal Plasticity 3 Prereq Math 440. Dislocation theory; slip; climb; mechanical properties of polycrystalline materials and application to important deformation processes.

514 Thermodynamics of Solids 3 Thermodynamic properties of solid solutions; models for substitutional and interstitial solutions; configurational and non-configurational contributions; calculation of phase diagrams.

515 Electronic Properties of Materials 3 Electron energy bands in solids, electrical conduction in metals and semiconductors, applications to semi-conduction devices based on silicon and III-V compounds.

516 Phase Transformations 3 Thermodynamics, nucleation, interface motion, mechanisms and kinetics of chemical reactions between solid metals and their environment.

517 Thin Films 3 Prereq graduate standing or senior in engineering or science. Materials science aspect of thin films, including growth, characterization, and properties for electrical, mechanical, corrosion, and optical behavior.

520 Multiscale Modeling in Thermodynamics of Materials 3 Prereq graduate standing or permission of instructor. Same as M E 520.

521 Statistics of Microstructures 3 Prereq Math 440, 540 or permission of instructor. Stereology, orientation and spatial distributions, percolation, measurement techniques and application to modeling of microstructures.

523 Ceramics Processing 3 Prereq graduate standing. Fundamentals of ceramic processing science for thin films and bulk ceramics.

530 Elasticity 3 Prereq M E 414; graduate standing. Same as M E 530.

531 Theory of Plasticity 3 Rec M E 501. Same as M E 531.

534 Mechanics of Composite Materials 3 Prereq M E 414. Same as M E 534.

537 Fracture Mechanics and Mechanisms 3 Fracture mechanics and mechanisms and the microstructural origins of toughness in metals, polymers and composites.

543 Polymer Materials and Engineering 3 Prereq MSE 402. Same as C E 593.

544 Natural Fibers 3 Prereq graduate standing. Same as C E 594.

545 Polymer and Composite Processing 3 Prereq graduate standing. Same as C E 595.

546 Engineered Wood Composites 3 Same as C E 596.

547 Polymers and Surfaces for Adhesion 3 Prereq MSE 402 or 404. Same as C E 597.

548 Natural Fiber Polymer Composites 3 Prereq graduate standing. Same as C E 598.

592 Transmission Electron Microscopy 3 Development of the principles and applications of electron optics in microscopy.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Materials Science And Engineering

PHYS

410 Electronics 3 (1-6) Prereq Phys 102 or 202. Laboratory construction and investigation of electronic circuits employed in research instruments.

415 Quantum Physics Laboratory 3 (2-3) May be repeated for credit; cumulative maximum 6 hours. Prereq Phys 304. Experiments in modern and quantum physics, fundamental interactions of radiations with matter.

443 Optics 3 Prereq Phys 341 or c//. Polarization, interference, coherence, and diffraction phenomena of the electromagnetic spectrum; optics of solids; laser resonators; gaussian beams; ABCD matrices.

450 Introduction to Quantum Mechanics 3 Prereq Math 315; Phys 303. Introduction to quantum theory with applications to atomic physics.

461 Introduction to Atomic and Molecular Physics 3 Prereq Phys 304. Introduction to atomic and molecular physics; spectroscopy.

463 Introduction to Solid State and Materials Physics 3 Prereq Phys 304. Introduction to the physics of solids; crystal structures, lattice vibrations, and electron theory.

465 Introductory Nuclear Physics 3 Prereq Phys 304. Nuclear systematics, apparatus of nuclear research, radioactivity, nuclear-atomic interactions, nuclear reactions and scattering; introductory particle physics.

466 Biological Physics 3 Prereq Chem 106; Math 172; Phys 202. Fundamental physics and thermodynamics of the cell; mechanics of biomolecular machines. Credit not granted for both Phys 466 and 566.

490 Undergraduate Thesis 1 Preliminary thesis draft of a laboratory or library research experience, oral presentation, and final draft.

499 Special Problems V 1 (0-3) to 4 (0-12) May be repeated for credit.

501 Graduate Seminar 1 Introduction to graduate and interdisciplinary research.

514 Optoelectronics Lab I 1 (0-3) May be repeated for credit; cumulative maximum 3 hours. Prereq graduate standing. Experiments with optical systems: Imaging, interference, coherence, information storage/processing, gas and solid state lasers, optical fibers, and communications systems.

515 Optoelectronics Lab II V 1 (0-3) to 3 (0-9) May be repeated for credit; cumulative maximum 3 hours. Prereq graduate standing. Experiments in optical physics, physical properties of light, laser physics, waveguides, quantum confined semiconductor structures and ultrafast dynamics and nonlinear optics.

521 Classical Mechanics I 3 Prereq Phys 320; 571 or c//. Laws of motion as developed by Newton, d'Alembert, Lagrange, and Hamilton; dynamics of particles and rigid bodies.

522 Classical Mechanics II 3 Prereq Phys 521. Continuation of Phys 521. Classical mechanics of liquids and deformable solids; stress, deformation and strain, flow, oscillations and waves.

533 Thermal and Statistical Physics I 3 Prereq Math 440; Phys 330. Thermodynamic laws and potentials, kinetic theory, hydrodynamics and transport coefficients; introduction to statistical mechanics, ensembles, partition functions.

534 Thermal and Statistical Physics II 3 Prereq Chem 531, 535; or Phys 533, 551. Phase transitions and critical phenomena, Ginzburg-Landau theory, Bose-Einstein condensation, superfluids, Fermi systems, low-temperature expansions.

541 Electromagnetic Theory 3 Prereq Phys 342, 571 or c//. Special relativity and the classical electromagnetic field; emission, propagation, and absorption of electromagnetic waves.

542 Electrodynamics 3 Prereq Phys 541. Interaction of matter and electromagnetic radiation; classical and quantum electrodynamics.

545 Nonlinear Optics 3 Prereq Phys 534, 542, 551. Nonlinear wave propagation theory applied to several nonlinear-optical phenomena; experimental techniques that probe a material's nonlinearity.

546 Quantum Electronics 3 Prereq Phys 541, 551 or c//. The physics of lasers and of coherent optical radiation generation and propagation.

550 Quantum Theory I 3 Prereq Math 440, 441; Phys 450. Introduction to quantum theory; physical and mathematical foundations; application to atomic systems.

551 Quantum Theory II 3 Prereq Phys 550, 571. Symmetry and invariance; angular momentum theory; approximation methods.

552 Quantum Theory III 3 Prereq Phys 551. Scattering theory; relativistic wave mechanics; quantum field theory.

561 Atomic and Molecular Physics 3 Prereq Phys 550. Physics of atoms and molecules using quantum theory.

566 Biological Physics 3 Graduate-level counterpart of Phys 466; additional requirements. Credit not granted for both Phys 466 and 566.

571 Methods of Theoretical Physics 3 Prereq Math 440, 441. Mathematical methods for theoretical physics; linear algebra, tensor analysis, complex variables, differential equations, integral equations, variational calculus, and group theory.

575 Advanced Solid State Physics 3 Prereq Phys 534, 542, 552 or c//, 563, 571. Quantum theory of solids; Green's functions, correlation functions and other field-theoretic methods; magnetism, superconductivity and transport properties.

581 Advanced Topics 3 May be repeated for credit; cumulative maximum 12 hours. Topics of current interest in advanced physics.

590 Seminar 1 May be repeated for credit.

592 Wave Propagation Seminar 2 May be repeated for credit; cumulative maximum 4 hours. Prereq Math 440, 441. Waves in the continuum; elastic, plastic, and hydrodynamic waves; shock waves.

598 Teaching Undergraduate Physics Laboratories 1 May be repeated for credit; cumulative maximum 4 hours. Principles and practices of teaching, planning and management of undergraduate physics laboratories; choice and care of equipment.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Materials Science And Engineering

PHYS

563 Physics of the Solid State 3 Prereq Phys 534, 551. Lattice vibrations and defects; ionic and electronic conductivities; band theory; magnetic properties; luminescence.

Materials Science and Engineering

Degree offered: Master of Science in Materials Science and Engineering

Faculty working with graduate students: 31

Graduate students: 20

Graduate students receiving assistantships or scholarships: 55%

Tests required: TOEFL, TOEFLI, GRE (Quantitative), GRE (Verbal)

Deadline: Fall: January 10
Spring: July 1

Requirements

Of the minimum 21 graded credit hours, the student must take 1) 3 credit hours of Math 540, 2) a minimum of 6 credit hours at the 400- or 500-level (MME or non-MME), and 3) a minimum of 12 credit hours at the 500-level (MME only; at least 9 of these must be MSE courses). Note: a maximum of 6 credit hours of graded coursework at the 300- and 400-level can be included in the program. Also required: 1) a minimum of 4 credit hours of MSE 700 and 2) 2 credit hours of ME 598 or MatS 593 (seminar). All programs must have a minimum total credits of 30.

Program Description

The graduate program in the School of Mechanical and Materials Engineering has a long history of excellence in graduate education. Our School offers specialization in a variety of disciplines in which graduate students develop cutting-edge knowledge and techniques using state-of-the-art research facilities. Our mission is to educate engineering students to be successful, world-class professionals capable of dynamic contributions in contemporary engineering practice and research and development.

Degree Description

Our School offers programs of study for full time and part-time students leading to the degrees of Master of Science (MS) in Mechanical Engineering (Pullman and Tri-Cities campuses), MS in Materials Science & Engineering (Pullman campus), and Doctor of Philosophy (Ph.D.) in Mechanical Engineering (Pullman campus). Our School participates in the interdisciplinary degree programs of MS in Engineering, Ph.D. in Engineering Science, and Ph.D. in Materials Science & Engineering. Thesis and non-thesis options are available for the MS degree. Programs of study are individualized with an interdisciplinary focus. Students are expected to pursue their degree programs with success and to earn the MS degree in two years and the Ph.D. in four years. The program will culminate with a final oral examination and a written thesis (MS thesis option), project report (MS non-thesis option), or dissertation (Ph.D.). Financial aid in the form of an assistantship is available for dedicated, quality full time MS and Ph.D. students.

Training and Professional Development Opportunities

Our School offers state-of-the-art research facilities enabling students to work on cutting-edge research over a wide range of topics, presenting and publishing results along with our world-class faculty. Leadership, communication, and instructional experience can be gained by PhD students through the option of serving as a teaching assistant for one or more courses during their program. Serving on University committees promotes professional development. Presenting papers at or attending regional conferences and international conferences and proceedings enriches scholarly development. Low-cost or free workshops on grant writing and leadership/professional development are routinely offered by the University. Opportunities exist for internships in industry and national labs.

Post-Graduate Employment Opportunities

University research and teaching positions, research positions in national laboratories, postdoctoral positions in national laboratories, and technical positions in leading companies.

Post-Graduate Career Placements

Recent graduates are working at Boeing, Hewlett-Packard, Hitachi, Intel, Lawrence Livermore National Laboratory, Los Alamos National Laboratory, Micron Technology, PACCAR, Pacific Northwest National Laboratory, Parametric Technology Corp, Tektronix, U.S. Army, ARDEC, Boise State University, Princeton University, University of California Berkeley, University of Kentucky, University of New Mexico, and Sandia National Laboratory.

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Gaurav Ameta, Stephen Antolovich, David Bahr, Amit Bandyopadhyay, Susmita Bose, Jow-Lian Ding, Indranath Dutta, Prashanta Dutta, Karl Englund, David Field, Sankar Jayaram, Uma Jayaram, William Kinsel, Jacob Leachman, David Lin, Kelvin Lynn, Konstantin Matveev, Sinisa Mesarovic, Changki Mo, M Norton, Jitesh Panchal, Charles Pezeshki, Marvin Pitts, Cecilia Richards, Robert Richards, Lloyd Smith, Anita Vasavada, Michael Wolcott, Hussein Zbib, Jinwen Zhang and Weihong Zhong.

Mechanical Engineering

M E

301 Fundamentals of Thermodynamics 3 Prereq Phys 201 with a grade of C or better. Thermodynamic properties of matter, ideal and real gases, work and heat, first and second laws and their application to engineering systems.

303 Fluid Mechanics 3 Prereq M E 212. Fluid statics, laminar and turbulent flow, similitude, pipe flow, boundary layers, lift and drag and measurement techniques.

305 Thermal and Fluids Laboratory 2 (1-3) Prereq major in engineering; M E 301; M E 303; Math 370 or c//. Instrumentation, data acquisition, and theory verification in the thermal and fluid sciences.

310 Manufacturing Processes 3 (2-3) Prereq MSE 201, major in engineering. Manufacturing processes, material fabrication, and nontraditional processing; manufacturing processes laboratory in machining, joining, forming; manufacturing project.

311 Manufacturing Processes Laboratory 1 (0-3) Prereq M E 310 or c//, major in engineering. Manufacturing processes laboratory in machining, welding, forming; manufacturing project.

313 Engineering Analysis 3 (2-3) Prereq Math 315; computer science programming. Analysis and modeling of engineering problems utilizing numerical and mathematical techniques and computers.

316 Systems Design 3 Prereq C E 215; M E 216; major in engineering. Systems and component design; product development from specifications to manufacturing; team-based CAD design projects; engineering economics; engineering professional skills.

348 Dynamics Systems 3 Prereq M E 212, 313, major in engineering. Fundamentals of vibration analysis, control systems, system modeling and dynamics analysis.

401 Mechatronics 3 (2-3) Prereq E E 304; M E 348 Integration of mechanical and microprocessor-based systems; control theory implemented with data acquisition systems; sensors; actuators, signal conditioning, programmable logic controllers.

402 Thermal Systems Design 3 Prereq M E 404, major in engineering. Design and analysis of thermofluid systems using principles of thermodynamics, fluid mechanics and heat transfer.

404 Heat Transfer 3 Prereq M E 301, 303 or c//, major in engineering. Conduction, radiation, and convection heat transfer; analytical, numerical, experimental results for solids, liquids, and gases; heat exchanger design.

406 Experimental Design 3 (1-6) Prereq M E 305, 316, 404; Rec M E 348. Designing, conducting, and reporting of experimental investigations involving mechanical equipment.

407 Computational Fluid Dynamics 3 Prereq M E 303. Basic concepts and applications of computational fluid dynamics to the analysis and design of fluid systems and components.

413 Mechanics of Solids 3 Prereq C E 215, MSE 201. Same as MSE 413.

414 Machine Design 3 Prereq C E 215, M E 316 or c//; major in engineering; rec M E 220. Optimal design of machinery; analysis for prevention of machine elements failure.

416 Mechanical Systems Design 3 (1-6) Prereq M E 348 or 375; M E 404; M E 414 or c//. Integrative design in mechanical engineering; multidisciplinary design project considering both technical and non-technical contexts; organizational dynamics and communications.

419 Air Conditioning 3 Prereq M E 404. Principles of heat and moisture transfer; air motion and purity in buildings; design of systems.

431 Design of Solar Thermal Systems 3 Prereq ME 301, 303, 404 and certified major in engineering or architecture. Design of solar thermal systems for heating and cooling of buildings, heating of water, electrical generation, industrial processes and distillation.

436 Combustion Engines 3 Prereq M E 303. Internal combustion engines; spark ignition engines, diesels, and gas turbines.

439 Applied Aerodynamics 3 Prereq M E 303. Aerodynamic lift and drag; circulation; boundary layers, application to subsonic aircraft wing design.

449 Mechanical Vibration 3 Prereq M E 348. Vibrating systems and noise producing mechanisms; design for noise and vibration control.

461 Introduction to Nuclear Engineering 3 Prereq junior or senior standing in engineering or physical sciences; Math 315 or equivalent. Applied nuclear physics; application to the nuclear fuel cycle and nuclear reactor core design; nuclear reactor systems and safety.

472 Finite Element Methods in Design 3 Prereq M E 414. Design of selected mechanical systems components using finite element analysis.

473 Advanced CAD and Geometric Modeling 3 (2-3) Prereq M E 316. Parametric and feature based CAD/CAM; geometric modeling and its mathematical basis; integration of CAD with design processes and other software.

474 Design for Manufacture and Modern Manufacturing Strategies 3 Prereq M E 310. Design for manufacture and assembly; modern manufacturing philosophies and practices; lean manufacturing; manufacturing cost and time analysis; quality control.

475 Manufacturing Enterprise Systems -- Automation and Product Realization 3 (2-3) Prereq MME computer programming course; M E 316. Manufacturing automation and product realization; role of information technology and electronic data in manufacturing enterprise systems; product life-cycle management (PLM) and related tools and processes; sustainable and green manufacturing.

481 Control Systems 3 Prereq M E 348. Analysis and design of feedback control systems.

483 Topics in Mechanical Engineering V 1 (0-4) to 4 (0-12) May be repeated for credit; cumulative maximum 7 hours. Contemporary topics in materials engineering.

495 Internship in Mechanical Industry 3 or 6 May be repeated for credit; cumulative maximum 12 hours. Prereq major in materials science engineering or mechanical engineering. By interview only. Students work full time on engineering assignment in approved industries with industrial and faculty supervision.

499 Special Problems V 1 (0-3) to 4 (0-12) May be repeated for credit.

501 Continuum Mechanics 3 Prereq graduate standing. Unified presentation of principles common to all branches of solid and fluid mechanics; viscous fluids, elasticity, viscoelasticity, and plasticity.

509 MEMS Engineering 3 (2-3) Prereq graduate standing or permission of instructor. Introduction to the design, fabrication and application of microelectromechanical systems.

513 Crystal Plasticity 3 Prereq Math 440. Same as MSE 513.

514 Thermodynamics of Solids 3 Same as MSE 514.

515 Advanced Heat Transfer 3 Derivation of the energy conservation equation; laminar and turbulent forced convection heat transfer with internal and external flow; free convection.

516 Conduction and Radiation Heat Transfer 3 Prereq M E 404. Principles of conduction and radiation heat transfer with focus on solving conduction and radiation problems of engineering interest.

517 Thin Films 3 Prereq graduate standing or senior in engineering or science. Same as MSE 517.

520 Multiscale Modeling in Thermomechanics of Materials 3 Prereq graduate standing or permission of instructor. Multiscale problems in thermomechanics of materials; practical and computational aspects of homogenization, granular materials, dislocation plasticity and atomistic methods.

521 Fundamentals of Fluids I 3 Prereq C E 315 or M E 303. Governing equations of fluid mechanics accompanied by applications of Navier-Stokes equation to simple flow situations, boundary layer analysis.

523 Engineering Acoustics 3 Prereq graduate standing. Fundamentals of acoustics including wave theory; transmission through layers; generation and reception, low frequency models; application to sound measurement, transducers, loudspeaker cabinet design, and nondestructive testing; acoustic design project required.

525 **Biomechanics** 3 Prereq B E 320, C E 215 or MSE 301; Math 315. Same as B E 525.

527 **Macroscopic Thermodynamics** 3 Advanced thermodynamics from macroscopic viewpoint; basic postulates, equilibrium, stability, property relations; application to thermal-fluid and solid mechanics; irreversible thermodynamics.

530 **Elasticity** 3 Prereq M E 414; graduate standing. Theory of kinematics of solid deformable bodies; conservation laws applied to an elastic continuum; generalized linear stress-strain behavior with applications.

531 **Theory of Plasticity** 3 The fundamentals of the theory of plasticity; the classical theory of plasticity; the classical theory and modern continuum theories of large elasto-plastic deformations.

532 **Finite Elements** 3 Same as C E 532.

534 **Mechanics of Composite Materials** 3 Prereq M E 414. Analysis of micromechanical and macromechanical behavior of composite materials with emphasis on fiber-reinforced composite; prediction of properties; stiffness and strength theories; laminated beams and plates; dynamic behavior; environmental effects.

537 **Fracture Mechanics and Mechanisms** 3 Same as MSE 537.

540 **Advanced Dynamics of Physical Systems** 3 Newtonian dynamics, rotating coordinate systems; Lagrangian and Hamiltonian mechanics; gyroscopic mechanics, other applications.

556 **Numerical Modeling in Fluid Mechanics** 3 Prereq C E 315. Fundamental concepts in development of numerical models for fluid flow with applications to steady and unsteady flows.

574 **Foundations of CAD** 3 Topics fundamental to the creation of CAD, engineering visualization, and virtual reality based engineering software.

575 **Geometric Modeling** 3 Study of the mathematics behind the creation of complex shapes for CAD using curves, surfaces, and solids.

579 **Advanced Topics in Mechanical Engineering** V 1-3 May be repeated for credit.

598 **Seminar** 1 May be repeated for credit. Current research interests.

600 **Special Projects or Independent Study** V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 **Master's Research, Thesis, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

Mechanical Engineering

MAT S

593 **Seminar in Materials Science** 1 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing. Presentation and discussion of topics in materials science taken from research in progress or current literature.

Mechanical Engineering

MATH

540 **Applied Mathematics I** 3 Prereq Math 315, graduate standing. Graduate-level counterpart of Math 440; additional requirements. Credit not granted for both Math 440 and 540.

Materials Science And Engineering

MSE

302 **Electronic Materials** 3 Prereq Chem 105, Phys 202 or c//. Structure of materials, electronic structure of solids; thermal, electrical, dielectric, and magnetic properties of materials; semiconductors processing.

312 **Thermodynamics and Phase Equilibrium** 3 Prereq MSE 201. Concepts of activity, equilibrium, solution properties; relationship between free energy, composition, and temperature; heterogeneous equilibria.

316 **Kinetics of Chemical and Physical Reactions** 3 Kinetics of heterogeneous chemical reactions; mechanisms and kinetics of diffusion; oxidation and other gas-metal reactions; polarized electrodes; corrosion; boundary migration; nucleation and growth; eutectoid and martensitic transformations.

320 **Materials Structure - Properties Lab** 3 (1-6) Prereq MSE 201 or c//; major in materials science engineering. Principles and techniques of optical metallography and other laboratory methods used in modern materials science and engineering.

321 **Materials Characterization** 3 Prereq MSE 201. Properties of x-rays, scattering and diffraction; crystal structures; x-ray diffraction methods, transmission electron microscopy and scanning electron microscopy.

323 **Materials Characterization Lab** 2 (1-3) Prereq MSE 321 or c//. Laboratory exercises on materials characterization: x-ray, TEM, SEM.

401 **Metallic Materials** 3 Prereq MSE 201. Major alloy systems and manufacturing processes; materials selection.

402 **Polymeric Materials** 3 Prereq MSE 201. Structural characterization, syntheses, and reactions of polymeric materials; relationships between structure and properties, viscoelasticity, deformation, and physical behavior of polymers.

403 **Ceramic Materials** 3 Prereq MSE 201. Processing, characteristics, microstructure, and properties of ceramic materials.

404 **Engineering Composites** 3 Prereq MSE 201. Basic concept in design and specifications of engineering composites.

406 **Biomaterials** 3 Prereq MSE 201. Overview of the different types of materials used in biomedical applications such as implants and medical devices. Credit not granted for both MSE 406 and 506.

413 **Mechanics of Solids** 3 Prereq C E 215, MSE 201. Elasticity, elastic stress distributions; plastic deformation of single and polycrystals; introduction to dislocation theory and its applications; creep, fracture, fatigue.

425 **Senior Thesis I** 2 (0-6) Prereq MSE 320, 323, senior in materials science engineering. Research in materials science and engineering.

426 **Senior Thesis II** 2 (0-6) Prereq MSE 320, 323, senior in materials science engineering. Research in materials science and engineering.

440 **Materials: The Foundations of Society and Technology** 3 Prereq completion of one Tier I and three Tier II courses. History of materials; role that materials have played in human development; modern societal, technological, and economic impact of materials.

483 **Topics in Materials Engineering** V 1 (0-4) to 4 (0-12) May be repeated for credit; cumulative maximum 7 hours. Contemporary topics in materials engineering.

499 **Special Problems** V 1 (0-3) to 4 (0-12) May be repeated for credit.

503 **Advanced Topics in Materials Engineering** V 1-3 May be repeated for credit; cumulative maximum 6 hours.

505 **Advanced Materials Science** 3 Broad baseline in materials science including relationships between structure and properties.

506 **Biomaterials** 3 Prereq MSE 201 and permission of instructor. Graduate-level counterpart of MSE 406; additional requirements. Credit not granted for both MSE 406 and 506.

508 Polymer Nanocomposites and Functionalities 3 Prereq MSE 402 or 404 rec. Structures, properties, fabrication and applications of nano-scale material and their polymer nanocomposites; functionalities including flame retardant, electrically, thermal and damping properties.

509 MEMS Engineering 3 (2-3) Prereq graduate standing. Same as M E 509.

513 Crystal Plasticity 3 Prereq Math 440. Dislocation theory; slip; climb; mechanical properties of polycrystalline materials and application to important deformation processes.

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515 Electronic Properties of Materials 3 Electron energy bands in solids, electrical conduction in metals and semiconductors, applications to semi-conduction devices based on silicon and III-V compounds.

516 Phase Transformations 3 Thermodynamics, nucleation, interface motion, mechanisms and kinetics of chemical reactions between solid metals and their environment.

517 Thin Films 3 Prereq graduate standing or senior in engineering or science. Materials science aspect of thin films, including growth, characterization, and properties for electrical, mechanical, corrosion, and optical behavior.

520 Multiscale Modeling in Thermodynamics of Materials 3 Prereq graduate standing or permission of instructor. Same as M E 520.

521 Statistics of Microstructures 3 Prereq Math 440, 540 or permission of instructor. Stereology, orientation and spatial distributions, percolation, measurement techniques and application to modeling of microstructures.

523 Ceramics Processing 3 Prereq graduate standing. Fundamentals of ceramic processing science for thin films and bulk ceramics.

530 Elasticity 3 Prereq M E 414; graduate standing. Same as M E 530.

531 Theory of Plasticity 3 Rec M E 501. Same as M E 531.

534 Mechanics of Composite Materials 3 Prereq M E 414. Same as M E 534.

537 Fracture Mechanics and Mechanisms 3 Fracture mechanics and mechanisms and the microstructural origins of toughness in metals, polymers and composites.

543 Polymer Materials and Engineering 3 Prereq MSE 402. Same as C E 593.

544 Natural Fibers 3 Prereq graduate standing. Same as C E 594.

545 Polymer and Composite Processing 3 Prereq graduate standing. Same as C E 595.

546 Engineered Wood Composites 3 Same as C E 596.

547 Polymers and Surfaces for Adhesion 3 Prereq MSE 402 or 404. Same as C E 597.

548 Natural Fiber Polymer Composites 3 Prereq graduate standing. Same as C E 598.

592 Transmission Electron Microscopy 3 Development of the principles and applications of electron optics in microscopy.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Materials Science and Engineering

Degree offered: Master of Science in Materials Science and Engineering - Non Thesis

Faculty working with graduate students: 31

Graduate students: 2

Tests required: GRE (Quantitative), GRE (Verbal), TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

Of the minimum 26 graded credit hours, the student must take 1) 3 credit hours of Math 540, 2) a minimum of 8 credit hours at the 400- or 500-level (MME or non-MME), and 3) a minimum of 15 credit hours at the 500-level. Note: a maximum of 9 credit hours of graded coursework at the 300- and 400-level can be included in the program. Also required: 1) a minimum of 4 credit hours of MSE 702 and 2) 2 credit hours of ME 598 or MatS 593 (seminar). All programs must have a minimum total credits of 30.

Program Description

The graduate program in the School of Mechanical and Materials Engineering has a long history of excellence in graduate education. Our School offers specialization in a variety of disciplines in which graduate students develop cutting-edge knowledge and techniques using state-of-the-art research facilities. Our mission is to educate engineering students to be successful, world-class professionals capable of dynamic contributions in contemporary engineering practice and research and development.

Degree Description

Our School offers programs of study for full time and part-time students leading to the degrees of Master of Science (MS) in Mechanical Engineering (Pullman and Tri-Cities campuses), MS in Materials Science & Engineering (Pullman campus), and Doctor of Philosophy (Ph.D.) in Mechanical Engineering (Pullman campus). Our School participates in the interdisciplinary degree programs of MS in Engineering, Ph.D. in Engineering Science, and Ph.D. in Materials Science & Engineering. Thesis and non-thesis options are available for the MS degree. Programs of study are individualized with an interdisciplinary focus. Students are expected to pursue their degree programs with success and to earn the MS degree in two years and the Ph.D. in four years. The program will culminate with a final oral examination and a written thesis (MS thesis option), project report (MS non-thesis option), or dissertation (Ph.D.). Financial aid in the form of an assistantship is available for dedicated, quality full time MS and Ph.D. students.

Training and Professional Development Opportunities

Our School offers state-of-the-art research facilities enabling students to work on cutting-edge research over a wide range of topics, presenting and publishing results along with our world-class faculty. Leadership, communication, and instructional experience can be gained by PhD students through the option of serving as a teaching assistant for one or more courses during their program. Serving on University committees promotes professional development. Presenting papers at or attending regional conferences and international conferences and proceedings enriches scholarly development. Low-cost or free workshops on grant writing and leadership/professional development are routinely offered by the University. Opportunities exist for internships in industry and national labs.

Post-Graduate Employment Opportunities

University research and teaching positions, research positions in national laboratories, postdoctoral positions in national laboratories, and technical positions in leading companies.

Post-Graduate Career Placements

Recent graduates are working at Boeing, Hewlett-Packard, Hitachi, Intel, Lawrence Livermore National Laboratory, Los Ala-

mos National Laboratory, Micron Technology, PACCAR, Pacific Northwest National Laboratory, Parametric Technology Corp, Tektronix, U.S. Army, ARDEC, Boise State University, Princeton University, University of California Berkeley, University of Kentucky, University of New Mexico, and Sandia National Laboratory.

Contact Information

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Mechanical Engineering

M E

301 **Fundamentals of Thermodynamics** 3 Prereq Phys 201 with a grade of C or better. Thermodynamic properties of matter, ideal and real gases, work and heat, first and second laws and their application to engineering systems.

303 **Fluid Mechanics** 3 Prereq M E 212. Fluid statics, laminar and turbulent flow, similitude, pipe flow, boundary layers, lift and drag and measurement techniques.

305 **Thermal and Fluids Laboratory** 2 (1-3) Prereq major in engineering; M E 301; M E 303; Math 370 or c//. Instrumentation, data acquisition, and theory verification in the thermal and fluid sciences.

310 **Manufacturing Processes** 3 (2-3) Prereq MSE 201, major in engineering. Manufacturing processes, material fabrication, and nontraditional processing; manufacturing processes laboratory in machining, joining, forming; manufacturing project.

311 **Manufacturing Processes Laboratory** 1 (0-3) Prereq M E 310 or c//, major in engineering. Manufacturing processes laboratory in machining, welding, forming; manufacturing project.

313 **Engineering Analysis** 3 (2-3) Prereq Math 315; computer science programming. Analysis and modeling of engineering problems utilizing numerical and mathematical techniques and computers.

316 **Systems Design** 3 Prereq C E 215; M E 216; major in engineering. Systems and component design; product development from specifications to manufacturing; team-based CAD design projects; engineering economics; engineering professional skills.

348 **Dynamics Systems** 3 Prereq M E 212, 313, major in engineering. Fundamentals of vibration analysis, control systems, system modeling and dynamics analysis.

401 **Mechatronics** 3 (2-3) Prereq E E 304; M E 348 Integration of mechanical and microprocessor-based systems; control theory implemented with data acquisition systems; sensors; actuators, signal conditioning, programmable logic controllers.

402 **Thermal Systems Design** 3 Prereq M E 404, major in engineering. Design and analysis of thermofluid systems using principles of thermodynamics, fluid mechanics and heat transfer.

404 **Heat Transfer** 3 Prereq M E 301, 303 or c//, major in engineering. Conduction, radiation, and convection heat transfer; analytical, numerical, experimental results for solids, liquids, and gases; heat exchanger design.

406 **Experimental Design** 3 (1-6) Prereq M E 305, 316, 404; Rec M E 348. Designing, conducting, and reporting of experimental investigations involving mechanical equipment.

407 **Computational Fluid Dynamics** 3 Prereq M E 303. Basic concepts and applications of computational fluid dynamics to the analysis and design of fluid systems and components.

413 **Mechanics of Solids** 3 Prereq C E 215, MSE 201. Same as MSE 413.

414 **Machine Design** 3 Prereq C E 215, M E 316 or c//; major in engineering; rec M E 220. Optimal design of machinery; analysis for prevention of machine elements failure.

416 **Mechanical Systems Design** 3 (1-6) Prereq M E 348 or 375; M E 404; M E 414 or c//. Integrative design in mechanical engineering; multidisciplinary design project considering both technical and non-technical contexts; organizational dynamics and communications.

419 **Air Conditioning** 3 Prereq M E 404. Principles of heat and moisture transfer; air motion and purity in buildings; design of systems.

431 **Design of Solar Thermal Systems** 3 Prereq ME 301, 303, 404 and certified major in engineering or architecture. Design of solar thermal systems for heating and cooling of buildings, heating of water, electrical generation, industrial processes and distillation.

436 **Combustion Engines** 3 Prereq M E 303. Internal combustion engines; spark ignition engines, diesels, and gas turbines.

439 **Applied Aerodynamics** 3 Prereq M E 303. Aerodynamic lift and drag; circulation; boundary layers, application to subsonic aircraft wing design.

449 **Mechanical Vibration** 3 Prereq M E 348. Vibrating systems and noise producing mechanisms; design for noise and vibration control.

461 **Introduction to Nuclear Engineering** 3 Prereq junior or senior standing in engineering or physical sciences; Math 315 or equivalent. Applied nuclear physics; application to the nuclear fuel cycle and nuclear reactor core design; nuclear reactor systems and safety.

472 **Finite Element Methods in Design** 3 Prereq M E 414. Design of selected mechanical systems components using finite element analysis.

473 **Advanced CAD and Geometric Modeling** 3 (2-3) Prereq M E 316. Parametric and feature based CAD/CAM; geometric modeling and its mathematical basis; integration of CAD with design processes and other software.

474 **Design for Manufacture and Modern Manufacturing Strategies** 3 Prereq M E 310. Design for manufacture and assembly; modern manufacturing philosophies and practices; lean manufacturing; manufacturing cost and time analysis; quality control.

475 **Manufacturing Enterprise Systems -- Automation and Product Realization** 3 (2-3) Prereq MME computer programming course; M E 316. Manufacturing automation and product realization; role of information technology and electronic data in manufacturing enterprise systems; product life-cycle management (PLM) and related tools and processes; sustainable and green manufacturing.

481 **Control Systems** 3 Prereq M E 348. Analysis and design of feedback control systems.

483 Topics in Mechanical Engineering V 1 (0-4) to 4 (0-12) May be repeated for credit; cumulative maximum 7 hours. Contemporary topics in materials engineering.

495 Internship in Mechanical Industry 3 or 6 May be repeated for credit; cumulative maximum 12 hours. Prereq major in materials science engineering or mechanical engineering. By interview only. Students work full time on engineering assignment in approved industries with industrial and faculty supervision.

499 Special Problems V 1 (0-3) to 4 (0-12) May be repeated for credit.

501 Continuum Mechanics 3 Prereq graduate standing. Unified presentation of principles common to all branches of solid and fluid mechanics; viscous fluids, elasticity, viscoelasticity, and plasticity.

509 MEMS Engineering 3 (2-3) Prereq graduate standing or permission of instructor. Introduction to the design, fabrication and application of microelectromechanical systems.

513 Crystal Plasticity 3 Prereq Math 440. Same as MSE 513.

514 Thermodynamics of Solids 3 Same as MSE 514.

515 Advanced Heat Transfer 3 Derivation of the energy conservation equation; laminar and turbulent forced convection heat transfer with internal and external flow; free convection.

516 Conduction and Radiation Heat Transfer 3 Prereq M E 404. Principles of conduction and radiation heat transfer with focus on solving conduction and radiation problems of engineering interest.

517 Thin Films 3 Prereq graduate standing or senior in engineering or science. Same as MSE 517.

520 Multiscale Modeling in Thermomechanics of Materials 3 Prereq graduate standing or permission of instructor. Multiscale problems in thermomechanics of materials; practical and computational aspects of homogenization, granular materials, dislocation plasticity and atomistic methods.

521 Fundamentals of Fluids I 3 Prereq C E 315 or M E 303. Governing equations of fluid mechanics accompanied by applications of Navier-Stokes equation to simple flow situations, boundary layer analysis.

523 Engineering Acoustics 3 Prereq graduate standing. Fundamentals of acoustics including wave theory; transmission through layers; generation and reception, low frequency models; application to sound measurement, transducers, loudspeaker cabinet design, and nondestructive testing; acoustic design project required.

525 Biomechanics 3 Prereq B E 320, C E 215 or MSE 301; Math 315. Same as B E 525.

527 Macroscopic Thermodynamics 3 Advanced thermodynamics from macroscopic viewpoint; basic postulates, equilibrium, stability, property relations; application to thermal-fluid and solid mechanics; irreversible thermodynamics.

530 Elasticity 3 Prereq M E 414; graduate standing. Theory of kinematics of solid deformable bodies; conservation laws applied to an elastic continuum; generalized linear stress-strain behavior with applications.

531 Theory of Plasticity 3 The fundamentals of the theory of plasticity; the classical theory of plasticity; the classical theory and modern continuum theories of large elasto-plastic deformations.

532 Finite Elements 3 Same as C E 532.

534 Mechanics of Composite Materials 3 Prereq M E 414. Analysis of micromechanical and macromechanical behavior of composite materials with emphasis on fiber-reinforced composite; prediction of properties; stiffness and strength theories; laminated beams and plates; dynamic behavior; environmental effects.

537 Fracture Mechanics and Mechanisms 3 Same as MSE 537.

540 Advanced Dynamics of Physical Systems 3 Newtonian dynamics, rotating coordinate systems; Lagrangian and Hamiltonian mechanics; gyroscopic mechanics, other applications.

556 Numerical Modeling in Fluid Mechanics 3 Prereq C E 315. Fundamental concepts in development of numerical models for fluid flow with applications to steady and unsteady flows.

574 Foundations of CAD 3 Topics fundamental to the creation of CAD, engineering visualization, and virtual reality based engineering software.

575 Geometric Modeling 3 Study of the mathematics behind the creation of complex shapes for CAD using curves, surfaces, and solids.

579 Advanced Topics in Mechanical Engineering V 1-3 May be repeated for credit.

598 Seminar 1 May be repeated for credit. Current research interests.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Mechanical Engineering

MAT S

593 Seminar in Materials Science 1 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing. Presentation and discussion of topics in materials science taken from research in progress or current literature.

Mechanical Engineering

MATH

540 Applied Mathematics I 3 Prereq Math 315, graduate standing. Graduate-level counterpart of Math 440; additional requirements. Credit not granted for both Math 440 and 540.

Materials Science And Engineering

MSE

302 Electronic Materials 3 Prereq Chem 105, Phys 202 or c//. Structure of materials, electronic structure of solids; thermal, electrical, dielectric, and magnetic properties of materials; semiconductors processing.

312 Thermodynamics and Phase Equilibrium 3 Prereq MSE 201. Concepts of activity, equilibrium, solution properties; relationship between free energy, composition, and temperature; heterogeneous equilibria.

316 Kinetics of Chemical and Physical Reactions 3 Kinetics of heterogeneous chemical reactions; mechanisms and kinetics of diffusion; oxidation and other gas-metal reactions; polarized electrodes; corrosion; boundary migration; nucleation and growth; eutectoid and martensitic transformations.

320 Materials Structure - Properties Lab 3 (1-6) Prereq MSE 201 or c//; major in materials science engineering. Principles and techniques of optical metallography and other laboratory methods used in modern materials science and engineering.

321 Materials Characterization 3 Prereq MSE 201. Properties of x-rays, scattering and diffraction; crystal structures; x-ray diffraction methods, transmission electron microscopy and scanning electron microscopy.

323 Materials Characterization Lab 2 (1-3) Prereq MSE 321 or c//. Laboratory exercises on materials characterization: x-ray, TEM, SEM.

401 Metallic Materials 3 Prereq MSE 201. Major alloy systems and manufacturing processes; materials selection.

402 Polymeric Materials 3 Prereq MSE 201. Structural characterization, syntheses, and reactions of polymeric materials; relationships between structure and properties, viscoelasticity, deformation, and physical behavior of polymers.

403 Ceramic Materials 3 Prereq MSE 201. Processing, characteristics, microstructure, and properties of ceramic materials.

404 Engineering Composites 3 Prereq MSE 201. Basic concept in design and specifications of engineering composites.

406 Biomaterials 3 Prereq MSE 201. Overview of the different types of materials used in biomedical applications such as implants and medical devices. Credit not granted for both MSE 406 and 506.

413 Mechanics of Solids 3 Prereq C E 215, MSE 201. Elasticity, elastic stress distributions; plastic deformation of single and polycrystals; introduction to dislocation theory and its applications; creep, fracture, fatigue.

425 Senior Thesis I 2 (0-6) Prereq MSE 320, 323, senior in materials science engineering. Research in materials science and engineering.

426 Senior Thesis II 2 (0-6) Prereq MSE 320, 323, senior in materials science engineering. Research in materials science and engineering.

440 Materials: The Foundations of Society and Technology 3 Prereq completion of one Tier I and three Tier II courses. History of materials; role that materials have played in human development; modern societal, technological, and economic impact of materials.

483 Topics in Materials Engineering V 1 (0-4) to 4 (0-12) May be repeated for credit; cumulative maximum 7 hours. Contemporary topics in materials engineering.

499 Special Problems V 1 (0-3) to 4 (0-12) May be repeated for credit.

503 Advanced Topics in Materials Engineering V 1-3 May be repeated for credit; cumulative maximum 6 hours.

505 Advanced Materials Science 3 Broad baseline in materials science including relationships between structure and properties.

506 Biomaterials 3 Prereq MSE 201 and permission of instructor. Graduate-level counterpart of MSE 406; additional requirements. Credit not granted for both MSE 406 and 506.

508 Polymer Nanocomposites and Functionalities 3 Prereq MSE 402 or 404 rec. Structures, properties, fabrication and applications of nano-scale material and their polymer nanocomposites; functionalities including flame retardant, electrically, thermal and damping properties.

509 MEMS Engineering 3 (2-3) Prereq graduate standing. Same as M E 509.

513 Crystal Plasticity 3 Prereq Math 440. Dislocation theory; slip; climb; mechanical properties of polycrystalline materials and application to important deformation processes.

514 Thermodynamics of Solids 3 Thermodynamic properties of solid solutions; models for substitutional and interstitial solutions; configurational and non-configurational contributions; calculation of phase diagrams.

515 Electronic Properties of Materials 3 Electron energy bands in solids, electrical conduction in metals and semiconductors, applications to semi-conduction devices based on silicon and III-V compounds.

516 Phase Transformations 3 Thermodynamics, nucleation, interface motion, mechanisms and kinetics of chemical reactions between solid metals and their environment.

517 Thin Films 3 Prereq graduate standing or senior in engineering or science. Materials science aspect of thin films, including growth, characterization, and properties for electrical, mechanical, corrosion, and optical behavior.

520 Multiscale Modeling in Thermodynamics of Materials 3 Prereq graduate standing or permission of instructor. Same as M E 520.

521 Statistics of Microstructures 3 Prereq Math 440, 540 or permission of instructor. Stereology, orientation and spatial distributions, percolation, measurement techniques and application to modeling of microstructures.

523 Ceramics Processing 3 Prereq graduate standing. Fundamentals of ceramic processing science for thin films and bulk ceramics.

530 Elasticity 3 Prereq M E 414; graduate standing. Same as M E 530.

531 Theory of Plasticity 3 Rec M E 501. Same as M E 531.

534 Mechanics of Composite Materials 3 Prereq M E 414. Same as M E 534.

537 Fracture Mechanics and Mechanisms 3 Fracture mechanics and mechanisms and the microstructural origins of toughness in metals, polymers and composites.

543 Polymer Materials and Engineering 3 Prereq MSE 402. Same as C E 593.

544 Natural Fibers 3 Prereq graduate standing. Same as C E 594.

545 Polymer and Composite Processing 3 Prereq graduate standing. Same as C E 595.

546 Engineered Wood Composites 3 Same as C E 596.

547 Polymers and Surfaces for Adhesion 3 Prereq MSE 402 or 404. Same as C E 597.

548 Natural Fiber Polymer Composites 3 Prereq graduate standing. Same as C E 598.

592 Transmission Electron Microscopy 3 Development of the principles and applications of electron optics in microscopy.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Mathematics

Degree offered: Doctor of Philosophy (Mathematics)

Faculty working with graduate students: 26

Graduate students: 38

Graduate students receiving assistantships or scholarships: 97%

Tests required: TOEFL

Deadline: Fall: January 10
Spring: July 1

Program Description

The advanced degrees in mathematics offered at Washington State University are MS in Mathematics (which also has an Applied Mathematics Option and a Mathematics Teaching Option), PhD in Mathematics (which also has an Applied Mathematics), and PhD in Mathematics with Teaching Emphasis.In all of our degree programs we attempt to combine a sound general core of fundamental

mathematics with electives that reflect individual interests, needs, and opportunities. People having oneof these degrees will be better at some things than at others, but they will have a general groundingin mathematics that should be valuable to them in any mathematical work they do.Graduate students should accept much of the responsibility for their own training. This includes notonly planning a meaningful program of study, studying for courses and examinations, and writinga thesis, but also voluntarily and energetically devoting time to outside reading of both books andjournals; attending colloquia and special lectures by local and visiting speakers; working on assignedproblems; participating actively in credit and noncredit seminars and professional meetings; andfrequently discussing mathematics with colleagues. Active mathematicians do these things as amatter of course, and graduate school is not too soon to develop these habits.Further details about are our graduate program can be found at http://www.math.wsu.edu/info/handbook.php

Degree Description

The degree of Doctor of Philosophy (PhD) in Mathematics is awarded in recognition of distinctive scholarship and original contributions to knowledge in Mathematics. The PhD program is especially designed to prepare the student for teaching at the graduate level, and doing mathematical research in academic settings, and in industrial and business settings. The Requirements for thePhD in Mathematics (Applied Mathematics Option)The specialization of modern academic disciplines provides both a challenge to those who wish todo research at the interface of mathematics and its areas of application and many opportunitiesto make valuable contributions. The Applied Mathematics Option allows students from a range ofbackgrounds to pursue a traditional applied mathematics program, while retaining the option tothoroughly learn an area of application. Entering students may not necessarily have a bachelor'sdegree in Mathematics. However, they will be required to demonstrate a grasp of the core areas ofadvanced calculus and linear algebra at the level of a bachelor's degree in Mathematics. They willthen be given great latitude to take specialized courses in Mathematics and their area of application.The Requirements for thePhD in Mathematics with Teaching EmphasisThe degree of PhD in Mathematics with Teaching Emphasis certifies completion of a graduateprogram designed to provide exceptionally strong preparation for scholarship in the teaching andlearning of mathematics. It differs from the PhD in Mathematics and PhD in Mathematics(Applied Mathematics Option) in its focus, but not in the expected level of competence.The requirements for the PhD in Mathematics with Teaching Emphasis include as much competence in core mathematics as the PhD in Mathematics and PhD in Mathematics (Applied Mathematics Option), as well as study in the research methodologies applicable to pedagogical researchin mathematics.

Post-Graduate Employment Opportunities

Teaching Professor,Software Developer, Bio-statistician, Risk Analyst, Technical Service, Post Doctorate

Post-Graduate Career Placements

Assistant Professor, Ateneo de Manila University, Philippines Post-Doctorate, University of Maryland - Tulane University, New Orleans, LA Lecturer, Eastern Washington University, Cheney, WA Technical Serices, Epic Systems, Madison, WI Assistant Professor, Eastern Oregon University, LaGrande, OR Assistant Professor, Cabrini College, Radnor, PA Software Developer, Bloomberg, New York, NY Biostatistician, Axio Research, Seattle, WA Assistant Professor, Whitworth, University, Spokane, WA Assistant Professor, George Fox University, Newberg, OR Senior Rick Analyst, J.P. Morgan Chase & Co., Columbus, OH

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MATH

500 **Proseminar** 1 May be repeated for credit; cumulative maximum 2 hours.

501 **Real Analysis** 3 Prereq Math 402. Metric spaces, convergence, continuous functions, infinite series, differentiation and integration of functions of one and several variables.

502 **Introduction to Functional Analysis** 3 Prereq Math 420, 501. Normed linear spaces, Banach spaces, introduction to Hilbert space, linear operators.

503 **Complex Analysis** 3 Prereq Math 501. Analytic functions, complex integration, Taylor and Laurent series, conformal mapping, Riemann surfaces and analytic continuation.

504 **Measure and Integration** 3 Prereq Math 501. Lebesque measure, Lebesque integration, differentiation, L spaces, general measure and integration, Radon-Nikodym Theorem, outer measure and product measures.

505 **Abstract Algebra** 3 Prereq Math 421. Groups, rings, fields, and homological algebra.

507 **Advanced Theory of Numbers** 3 May be repeated for credit; cumulative maximum 6 hours. Analytic and algebraic number theory.

511 **Advanced Linear Algebra** 3 Prereq Math 420. Vector spaces, inner products, unitary equivalence, similarity, Jordan forms, normality, spectral theory, singular value decomposition, norms and inequalities.

512 **Ordinary Differential Equations** 3 Prereq Math 402. Existence of solutions; linear systems; qualitative behavior, especially stability; periodic solutions.

525 **General Topology** 3 Prereq Math 402. Sets, metric spaces, topological spaces; continuous mappings, compactness, connectedness, local properties, function spaces, and fundamental groups.

531 **Intersections of Culture and Mathematics** 3 (2-2) Graduate-level counterpart of Math 431; additional requirements. Credit not granted for both Math 431 and 531.

544 **Advanced Matrix Computations** 3 Prereq Math 448. Advanced topics in the solution of linear systems and eigenvalue problems, including parallel matrix computations.

555 **Topics in Combinatorics** 3 May be repeated for credit; cumulative maximum 6 hours. Combinatorics, generating functions, recurrence relations, inclusion-exclusion, coding theory; experimental design, graph theory.

Mathematics

Degree offered: Master of Science in Mathematics

Faculty working with graduate students: 26

Graduate students: 5

Graduate students receiving assistantships or scholarships: 100%

Deadline: Fall: January 10
Spring: July 1

Requirements

The Requirements for the MS in MathematicsThe degree of Master of Science (MS) in Mathematics represents substantial mathematical trainingbeyond the baccalaureate, which is sufficient for many career goals. Doctoral students completemost of the MS requirements in the course of their studies, and often receive an MS degree as anintermediate step en route to the doctorate. However, the MS degree is efficacious in its own right,and is not necessarily a stepping stone to a doctoral degree. Furthermore, attainment of the MSdegree does not guarantee admission to a doctoral program.The Requirements for theMS in Mathematics (Applied Mathematics Option)This is a two-year professional degree especially designed to train mathematicians and scientists/engineers with strong mathematics backgrounds in up-to-date applied mathematical, computational and statistical skills. Such training is intended to produce high caliber individuals whocan confidently undertake interdisciplinary research. The focus will be in preparing talented individuals to face the mathematical and other research challenges in business and/or industrialsectors.In order to achieve these goals the program requires:_ a broad background in the areas of Numerical Analysis/Optimization, Modeling/Simulation,and Statistical Analysis;_ a concentration in one of the above areas;_ practice in both written and oral communication;_ both group and individual projects;_ a strong computing component.The Requirements for theMS in Mathematics (Mathematics Teaching Option)This is a two-year professional degree designed to prepare teachers of mathematics at the communitycollege, four-year college, or secondary levels. The program combines advanced work in mathematicswith coursework in education and practice teaching, providing a foundation in both mathematicalcontent and teaching methodology.

Program Description

The advanced degrees in mathematics offered at Washington State University are MS in Mathematics (which also has an Applied Mathematics Option and a Mathematics Teaching Option), PhD in Mathematics (which also has an Applied Mathematics), and PhD in Mathematics with Teaching Emphasis.In all of our degree programs we attempt to combine a sound general core of fundamental mathematics with electives that reflect individual interests, needs, and opportunities. People having oneof these degrees will be better at some things than at others, but they will have a general groundingin mathematics that should be valuable to them in any mathematical work they do.Graduate students should accept much of the responsibility for their own training. This includes notonly planning a meaningful program of study, studying for courses and examinations, and writinga thesis, but also voluntarily and energetically devoting time to outside reading of both books andjournals; attending colloquia and special lectures by local and visiting speakers; working on assignedproblems; participating actively in credit and noncredit seminars and professional meetings; andfrequently discussing mathematics with colleagues. Active mathematicians do these things as amatter of course, and graduate school is not too soon to develop these habits.Further details about are our graduate program can be found at http://www.math.wsu.edu/info/handbook.php

Degree Description

The advanced degrees in mathematics offered at Washington State University are MS in Mathematics (which also has an Applied Mathematics Option and a Mathematics Teaching Option), PhD in Mathematics (which also has an Applied Mathematics), and PhD in Mathematics with Teaching Emphasis. In all of our degree programs we attempt to combine a sound general core of fundamental mathematics with electives that reflect individual interests, needs, and opportunities. People having one of these degrees will be better at some things than at others, but they will have a general grounding in mathematics that should be valuable to them in any mathematical work they do. Graduate students should accept much of the responsibility for their own training. This includes not only planning a meaningful program of study, studying for courses and examinations, and writing a thesis, but also voluntarily and energetically devoting time to outside reading of both books and journals; attending colloquia and special lectures by local and visiting speakers; working on assigned problems; participating actively in credit and noncredit seminars and professional meetings; and frequently discussing mathematics with colleagues. Active mathematicians do these things as a matter of course, and graduate school is not too soon to develop these habits. Further details about are our graduate program can be found at http://www.math.wsu.edu/info/handbook.php

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MATH

500 **Proseminar** 1 May be repeated for credit; cumulative maximum 2 hours.

516 **Simulation Methods** 3 Prereq Math 360 and a computer programming course. Graduate-level counterpart of Math 416; additional requirements. Credit not granted for both Math 416 and 516.

540 **Applied Mathematics I** 3 Prereq Math 315, graduate standing. Graduate-level counterpart of Math 440; additional requirements. Credit not granted for both Math 440 and 540.

548 **Numerical Analysis** 3 Prereq FORTRAN, C, or other programming language; Math 315; graduate standing. Graduate-level counterpart of Math 448; additional requirements. Credit not granted for both Math 448 and 548.

564 **Nonlinear Optimization I** 3 Prereq advanced multivariate calculus and a programming language; Rec Math 464, 544. Theory and algorithms for unconstrained nonlinear optimization problems, including line search, trust region, conjugate gradient, Newton and quasi-Newton methods.

566 **Optimization in Networks** 3 Prereq graduate standing; Math 325 or 364, or knowledge of linear programming. Graduate-level counterpart of Math 466; additional requirements. Credit not granted for both Math 466 and 566.

STAT

523 **Statistical Methods for Engineers and Scientists** 3 Prereq Stat 360 or one 3 hour statistics course. Graduate-level counterpart of Stat 423; additional requirements. Credit not granted for both Stat 423 and 523.

572 **Quality Control** 3 Prereq Stat 360 or 443. Simple quality assurance tools; process monitoring; Shewhart control charts; process characterization and capability; sampling inspection; factorial experiments.

Mechanical Engineering

Degree offered: Doctor of Philosophy (Mechanical Engineering)

Faculty working with graduate students: 31

Graduate students: 47

Graduate students receiving assistantships or scholarships: 93%

Tests required: GRE (Quantitative), GRE (Verbal), TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

Of the minimum 24 graded credit hours, the student must take 1) 3 credit hours of Math 540 or equivalent, 2) a minimum of 12 credit hours of 500-level ME or MSE courses, and 3) 9 credit hours of additional 500-level courses approved by the student's advisor. Note: a maximum of 9 credit hours of graded coursework at the 300- and 400-level can be included in the program. Also required: 1) a minimum of 20 credit hours of ME 800 and 2) 3 credit hours of ME 598 or MatS 593 (seminar). All programs must have a minimum total credits of 72.

Program Description

The graduate program in the School of Mechanical and Materials Engineering has a long history of excellence in graduate education. Our School offers specialization in a variety of disciplines in which graduate students develop cutting-edge knowledge and techniques using state-of-the-art research facilities. Our mission is to educate engineering students to be successful, world-class professionals capable of dynamic contributions in contemporary engineering practice and research and development.

Degree Description

Our School offers programs of study for full time and part-time students leading to the degrees of Master of Science (MS) in Mechanical Engineering (Pullman and Tri-Cities campuses), MS in Materials Science & Engineering (Pullman campus), and Doctor of Philosophy (Ph.D.) in Mechanical Engineering (Pullman campus). Our School participates in the interdisciplinary degree programs of MS in Engineering, Ph.D. in Engineering Science, and Ph.D. in Materials Science & Engineering. Thesis and non-thesis options are available for the MS degree. Programs of study are individualized with an interdisciplinary focus. Students are expected to pursue their degree programs with success and to earn the MS degree in two years and the Ph.D. in four years. The program will culminate with a final oral examination and a written thesis (MS thesis option), project report (MS non-thesis option), or dissertation (Ph.D.). Financial aid in the form of an assistantship is available for dedicated, quality full time MS and Ph.D. students.

Training and Professional Development Opportunities

Our School offers state-of-the-art research facilities enabling students to work on cutting-edge research over a wide range of topics, presenting and publishing results along with our world-class faculty. Leadership, communication, and instructional experience can be gained by PhD students through the option of serving as a teaching assistant for one or more courses during their program. Serving on University committees promotes professional development. Presenting papers at or attending regional conferences and international conferences and proceedings enriches scholarly development. Low-cost or free workshops on grant writing and leadership/professional development are routinely offered by the University. Opportunities exist for internships in industry and national labs.

Post-Graduate Employment Opportunities

University research and teaching positions, research positions in national laboratories, postdoctoral positions in national laboratories, and technical positions in leading companies.

Post-Graduate Career Placements

Recent graduates are working at Boeing, Hewlett-Packard, Hitachi, Intel, Lawrence Livermore National Laboratory, Los Alamos National Laboratory, Micron Technology, PACCAR, Pacific Northwest National Laboratory, Parametric Technology Corp, Tektronix, U.S. Army, ARDEC, Boise State University, Princeton University, University of California Berkeley, University of Kentucky, University of New Mexico, and Sandia National Laboratory.

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Mechanical Engineering

M E

301 **Fundamentals of Thermodynamics** 3 Prereq Phys 201 with a grade of C or better. Thermodynamic properties of matter, ideal and real gases, work and heat, first and second laws and their application to engineering systems.

303 **Fluid Mechanics** 3 Prereq M E 212. Fluid statics, laminar and turbulent flow, similitude, pipe flow, boundary layers, lift and drag and measurement techniques.

305 **Thermal and Fluids Laboratory** 2 (1-3) Prereq major in engineering; M E 301; M E 303; Math 370 or c//. Instrumentation, data acquisition, and theory verification in the thermal and fluid sciences.

310 **Manufacturing Processes** 3 (2-3) Prereq MSE 201, major in engineering. Manufacturing processes, material fabrication, and nontraditional processing; manufacturing processes laboratory in machining, joining, forming; manufacturing project.

311 **Manufacturing Processes Laboratory** 1 (0-3) Prereq M E 310 or c//, major in engineering. Manufacturing processes laboratory in machining, welding, forming; manufacturing project.

313 **Engineering Analysis** 3 (2-3) Prereq Math 315; computer science programming. Analysis and modeling of engineering problems utilizing numerical and mathematical techniques and computers.

316 **Systems Design** 3 Prereq C E 215; M E 216; major in engineering. Systems and component design; product development from specifications to manufacturing; team-based CAD design projects; engineering economics; engineering professional skills.

348 **Dynamics Systems** 3 Prereq M E 212, 313, major in engineering. Fundamentals of vibration analysis, control systems, system modeling and dynamics analysis.

401 Mechatronics 3 (2-3) Prereq E E 304; M E 348 Integration of mechanical and microprocessor-based systems; control theory implemented with data acquisition systems; sensors; actuators, signal conditioning, programmable logic controllers.

402 Thermal Systems Design 3 Prereq M E 404, major in engineering. Design and analysis of thermofluid systems using principles of thermodynamics, fluid mechanics and heat transfer.

404 Heat Transfer 3 Prereq M E 301, 303 or c//, major in engineering. Conduction, radiation, and convection heat transfer; analytical, numerical, experimental results for solids, liquids, and gases; heat exchanger design.

406 Experimental Design 3 (1-6) Prereq M E 305, 316, 404; Rec M E 348. Designing, conducting, and reporting of experimental investigations involving mechanical equipment.

407 Computational Fluid Dynamics 3 Prereq M E 303. Basic concepts and applications of computational fluid dynamics to the analysis and design of fluid systems and components.

413 Mechanics of Solids 3 Prereq C E 215, MSE 201. Same as MSE 413.

414 Machine Design 3 Prereq C E 215, M E 316 or c//; major in engineering; rec M E 220. Optimal design of machinery; analysis for prevention of machine elements failure.

416 Mechanical Systems Design 3 (1-6) Prereq M E 348 or 375; M E 404; M E 414 or c//. Integrative design in mechanical engineering; multidisciplinary design project considering both technical and non-technical contexts; organizational dynamics and communications.

419 Air Conditioning 3 Prereq M E 404. Principles of heat and moisture transfer; air motion and purity in buildings; design of systems.

431 Design of Solar Thermal Systems 3 Prereq ME 301, 303, 404 and certified major in engineering or architecture. Design of solar thermal systems for heating and cooling of buildings, heating of water, electrical generation, industrial processes and distillation.

436 Combustion Engines 3 Prereq M E 303. Internal combustion engines; spark ignition engines, diesels, and gas turbines.

439 Applied Aerodynamics 3 Prereq M E 303. Aerodynamic lift and drag; circulation; boundary layers, application to subsonic aircraft wing design.

449 Mechanical Vibration 3 Prereq M E 348. Vibrating systems and noise producing mechanisms; design for noise and vibration control.

461 Introduction to Nuclear Engineering 3 Prereq junior or senior standing in engineering or physical sciences; Math 315 or equivalent. Applied nuclear physics; application to the nuclear fuel cycle and nuclear reactor core design; nuclear reactor systems and safety.

472 Finite Element Methods in Design 3 Prereq M E 414. Design of selected mechanical systems components using finite element analysis.

473 Advanced CAD and Geometric Modeling 3 (2-3) Prereq M E 316. Parametric and feature based CAD/CAM; geometric modeling and its mathematical basis; integration of CAD with design processes and other software.

474 Design for Manufacture and Modern Manufacturing Strategies 3 Prereq M E 310. Design for manufacture and assembly; modern manufacturing philosophies and practices; lean manufacturing; manufacturing cost and time analysis; quality control.

475 Manufacturing Enterprise Systems -- Automation and Product Realization 3 (2-3) Prereq MME computer programming course; M E 316. Manufacturing automation and product realization; role of information technology and electronic data in manufacturing enterprise systems; product life-cycle management (PLM) and related tools and processes; sustainable and green manufacturing.

481 Control Systems 3 Prereq M E 348. Analysis and design of feedback control systems.

483 Topics in Mechanical Engineering V 1 (0-4) to 4 (0-12) May be repeated for credit; cumulative maximum 7 hours. Contemporary topics in materials engineering.

501 Continuum Mechanics 3 Prereq graduate standing. Unified presentation of principles common to all branches of solid and fluid mechanics; viscous fluids, elasticity, viscoelasticity, and plasticity.

509 MEMS Engineering 3 (2-3) Prereq graduate standing or permission of instructor. Introduction to the design, fabrication and application of microelectromechanical systems.

513 Crystal Plasticity 3 Prereq Math 440. Same as MSE 513.

514 Thermodynamics of Solids 3 Same as MSE 514.

515 Advanced Heat Transfer 3 Derivation of the energy conservation equation; laminar and turbulent forced convection heat transfer with internal and external flow; free convection.

516 Conduction and Radiation Heat Transfer 3 Prereq M E 404. Principles of conduction and radiation heat transfer with focus on solving conduction and radiation problems of engineering interest.

517 Thin Films 3 Prereq graduate standing or senior in engineering or science. Same as MSE 517.

520 Multiscale Modeling in Thermomechanics of Materials 3 Prereq graduate standing or permission of instructor. Multiscale problems in thermomechanics of materials; practical and computational aspects of homogenization, granular materials, dislocation plasticity and atomistic methods.

521 Fundamentals of Fluids I 3 Prereq C E 315 or M E 303. Governing equations of fluid mechanics accompanied by applications of Navier-Stokes equation to simple flow situations, boundary layer analysis.

523 Engineering Acoustics 3 Prereq graduate standing. Fundamentals of acoustics including wave theory; transmission through layers; generation and reception, low frequency models; application to sound measurement, transducers, loudspeaker cabinet design, and nondestructive testing; acoustic design project required.

525 Biomechanics 3 Prereq B E 320, C E 215 or MSE 301; Math 315. Same as B E 525.

527 Macroscopic Thermodynamics 3 Advanced thermodynamics from macroscopic viewpoint; basic postulates, equilibrium, stability, property relations; application to thermal-fluid and solid mechanics; irreversible thermodynamics.

530 Elasticity 3 Prereq M E 414; graduate standing. Theory of kinematics of solid deformable bodies; conservation laws applied to an elastic continuum; generalized linear stress-strain behavior with applications.

531 Theory of Plasticity 3 The fundamentals of the theory of plasticity; the classical theory of plasticity; the classical theory and modern continuum theories of large elasto-plastic deformations.

532 Finite Elements 3 Same as C E 532.

534 **Mechanics of Composite Materials** 3 Prereq M E 414. Analysis of micromechanical and macromechanical behavior of composite materials with emphasis on fiber-reinforced composite; prediction of properties; stiffness and strength theories; laminated beams and plates; dynamic behavior; environmental effects.

537 **Fracture Mechanics and Mechanisms** 3 Same as MSE 537.

540 **Advanced Dynamics of Physical Systems** 3 Newtonian dynamics, rotating coordinate systems; Lagrangian and Hamiltonian mechanics; gyroscopic mechanics, other applications.

556 **Numerical Modeling in Fluid Mechanics** 3 Prereq C E 315. Fundamental concepts in development of numerical models for fluid flow with applications to steady and unsteady flows.

574 **Foundations of CAD** 3 Topics fundamental to the creation of CAD, engineering visualization, and virtual reality based engineering software.

575 **Geometric Modeling** 3 Study of the mathematics behind the creation of complex shapes for CAD using curves, surfaces, and solids.

579 **Advanced Topics in Mechanical Engineering** V 1-3 May be repeated for credit.

598 **Seminar** 1 May be repeated for credit. Current research interests.

600 **Special Projects or Independent Study** V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 **Doctoral Research, Dissertation, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

Mechanical Engineering

MAT S

593 **Seminar in Materials Science** 1 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing. Presentation and discussion of topics in materials science taken from research in progress or current literature.

Mechanical Engineering

MATH

540 **Applied Mathematics I** 3 Prereq Math 315, graduate standing. Graduate-level counterpart of Math 440; additional requirements. Credit not granted for both Math 440 and 540.

Materials Science And Engineering

MSE

302 **Electronic Materials** 3 Prereq Chem 105, Phys 202 or c//. Structure of materials, electronic structure of solids; thermal, electrical, dielectric, and magnetic properties of materials; semiconductors processing.

312 **Thermodynamics and Phase Equilibrium** 3 Prereq MSE 201. Concepts of activity, equilibrium, solution properties; relationship between free energy, composition, and temperature; heterogeneous equilibria.

316 **Kinetics of Chemical and Physical Reactions** 3 Kinetics of heterogeneous chemical reactions; mechanisms and kinetics of diffusion; oxidation and other gas-metal reactions; polarized electrodes; corrosion; boundary migration; nucleation and growth; eutectoid and martensitic transformations.

320 **Materials Structure - Properties Lab** 3 (1-6) Prereq MSE 201 or c//; major in materials science engineering. Principles and techniques of optical metallography and other laboratory methods used in modern materials science and engineering.

321 **Materials Characterization** 3 Prereq MSE 201. Properties of x-rays, scattering and diffraction; crystal structures; x-ray diffraction methods, transmission electron microscopy and scanning electron microscopy.

323 **Materials Characterization Lab** 2 (1-3) Prereq MSE 321 or c//. Laboratory exercises on materials characterization: x-ray, TEM, SEM.

401 **Metallic Materials** 3 Prereq MSE 201. Major alloy systems and manufacturing processes; materials selection.

402 **Polymeric Materials** 3 Prereq MSE 201. Structural characterization, syntheses, and reactions of polymeric materials; relationships between structure and properties, viscoelasticity, deformation, and physical behavior of polymers.

403 **Ceramic Materials** 3 Prereq MSE 201. Processing, characteristics, microstructure, and properties of ceramic materials.

404 **Engineering Composites** 3 Prereq MSE 201. Basic concept in design and specifications of engineering composites.

406 **Biomaterials** 3 Prereq MSE 201. Overview of the different types of materials used in biomedical applications such as implants and medical devices. Credit not granted for both MSE 406 and 506.

413 **Mechanics of Solids** 3 Prereq C E 215, MSE 201. Elasticity, elastic stress distributions; plastic deformation of single and polycrystals; introduction to dislocation theory and its applications; creep, fracture, fatigue.

425 **Senior Thesis I** 2 (0-6) Prereq MSE 320, 323, senior in materials science engineering. Research in materials science and engineering.

426 **Senior Thesis II** 2 (0-6) Prereq MSE 320, 323, senior in materials science engineering. Research in materials science and engineering.

440 **Materials: The Foundations of Society and Technology** 3 Prereq completion of one Tier I and three Tier II courses. History of materials; role that materials have played in human development; modern societal, technological, and economic impact of materials.

503 **Advanced Topics in Materials Engineering** V 1-3 May be repeated for credit; cumulative maximum 6 hours.

505 **Advanced Materials Science** 3 Broad baseline in materials science including relationships between structure and properties.

506 **Biomaterials** 3 Prereq MSE 201 and permission of instructor. Graduate-level counterpart of MSE 406; additional requirements. Credit not granted for both MSE 406 and 506.

508 **Polymer Nanocomposites and Functionalities** 3 Prereq MSE 402 or 404 rec. Structures, properties, fabrication and applications of nano-scale material and their polymer nanocomposites; functionalities including flame retardant, electrically, thermal and damping properties.

509 **MEMS Engineering** 3 (2-3) Prereq graduate standing. Same as M E 509.

513 **Crystal Plasticity** 3 Prereq Math 440. Dislocation theory; slip; climb; mechanical properties of polycrystalline materials and application to important deformation processes.

514 **Thermodynamics of Solids** 3 Thermodynamic properties of solid solutions; models for substitutional and interstitial solutions; configurational and non-configurational contributions; calculation of phase diagrams.

515 **Electronic Properties of Materials** 3 Electron energy bands in solids, electrical conduction in metals and semiconductors, applications to semi-conduction devices based on silicon and III-V compounds.

516 Phase Transformations 3 Thermodynamics, nucleation, interface motion, mechanisms and kinetics of chemical reactions between solid metals and their environment.

517 Thin Films 3 Prereq graduate standing or senior in engineering or science. Materials science aspect of thin films, including growth, characterization, and properties for electrical, mechanical, corrosion, and optical behavior.

520 Multiscale Modeling in Thermodynamics of Materials 3 Prereq graduate standing or permission of instructor. Same as M E 520.

521 Statistics of Microstructures 3 Prereq Math 440, 540 or permission of instructor. Stereology, orientation and spatial distributions, percolation, measurement techniques and application to modeling of microstructures.

523 Ceramics Processing 3 Prereq graduate standing. Fundamentals of ceramic processing science for thin films and bulk ceramics.

530 Elasticity 3 Prereq M E 414; graduate standing. Same as M E 530.

531 Theory of Plasticity 3 Rec M E 501. Same as M E 531.

534 Mechanics of Composite Materials 3 Prereq M E 414. Same as M E 534.

537 Fracture Mechanics and Mechanisms 3 Fracture mechanics and mechanisms and the microstructural origins of toughness in metals, polymers and composites.

543 Polymer Materials and Engineering 3 Prereq MSE 402. Same as C E 593.

544 Natural Fibers 3 Prereq graduate standing. Same as C E 594.

545 Polymer and Composite Processing 3 Prereq graduate standing. Same as C E 595.

546 Engineered Wood Composites 3 Same as C E 596.

547 Polymers and Surfaces for Adhesion 3 Prereq MSE 402 or 404. Same as C E 597.

548 Natural Fiber Polymer Composites 3 Prereq graduate standing. Same as C E 598.

592 Transmission Electron Microscopy 3 Development of the principles and applications of electron optics in microscopy.

Mechanical Engineering

Degree offered: Master of Science in Mechanical Engineering

Faculty working with graduate students: 31

Graduate students: 34

Graduate students receiving assistantships or scholarships: 73%

Program offered: Pullman, Tri-Cities

Tests required: GRE (Quantitative), GRE (Verbal), TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

Of the minimum 21 graded credit hours, the student must take 1) 3 credit hours of Math 540, 2) a minimum of 12 credit hours of 500-level ME courses, and 3) 6 credit hours of additional courses approved by the student's advisor. Note: a maximum of 6 credit hours of graded coursework at the 300- and 400-level can be included in the program. Also required: 1) a minimum of 4 credit hours of ME 700 and 2) 2 credit hours of ME 598 (seminar; Pullman students only). All programs must have a minimum total credits of 30.

Program Description

The graduate program in the School of Mechanical and Materials Engineering has a long history of excellence in graduate education. Our School offers specialization in a variety of disciplines in which graduate students develop cutting-edge knowledge and techniques using state-of-the-art research facilities. Our mission is to educate engineering students to be successful, world-class professionals capable of dynamic contributions in contemporary engineering practice and research and development.

Degree Description

Our School offers programs of study for full time and part-time students leading to the degrees of Master of Science (MS) in Mechanical Engineering (Pullman and Tri-Cities campuses), MS in Materials Science & Engineering (Pullman campus), and Doctor of Philosophy (Ph.D.) in Mechanical Engineering (Pullman campus). Our School participates in the interdisciplinary degree programs of MS in Engineering, Ph.D. in Engineering Science, and Ph.D. in Materials Science & Engineering. Thesis and non-thesis options are available for the MS degree. Programs of study are individualized with an interdisciplinary focus. Students are expected to pursue their degree programs with success and to earn the MS degree in two years and the Ph.D. in four years. The program will culminate with a final oral examination and a written thesis (MS thesis option), project report (MS non-thesis option), or dissertation (Ph.D.). Financial aid in the form of an assistantship is available for dedicated, quality full time MS and Ph.D. students.

Training and Professional Development Opportunities

Our School offers state-of-the-art research facilities enabling students to work on cutting-edge research over a wide range of topics, presenting and publishing results along with our world-class faculty. Leadership, communication, and instructional experience can be gained by PhD students through the option of serving as a teaching assistant for one or more courses during their program. Serving on University committees promotes professional development. Presenting papers at or attending regional conferences and international conferences and proceedings enriches scholarly development. Low-cost or free workshops on grant writing and leadership/professional development are routinely offered by the University. Opportunities exist for internships in industry and national labs.

Post-Graduate Employment Opportunities

University research and teaching positions, research positions in national laboratories, postdoctoral positions in national laboratories, and technical positions in leading companies.

Post-Graduate Career Placements

Recent graduates are working at Boeing, Hewlett-Packard, Hitachi, Intel, Lawrence Livermore National Laboratory, Los Alamos National Laboratory, Micron Technology, PACCAR, Pacific Northwest National Laboratory, Parametric Technology Corp, Tektronix, U.S. Army, ARDEC, Boise State University, Princeton University, University of California Berkeley, University of Kentucky, University of New Mexico, and Sandia National Laboratory.

Contact Information

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M E

301 Fundamentals of Thermodynamics 3 Prereq Phys 201 with a grade of C or better. Thermodynamic properties of matter, ideal and real gases, work and heat, first and second laws and their application to engineering systems.

303 Fluid Mechanics 3 Prereq M E 212. Fluid statics, laminar and turbulent flow, similitude, pipe flow, boundary layers, lift and drag and measurement techniques.

305 Thermal and Fluids Laboratory 2 (1-3) Prereq major in engineering; M E 301; M E 303; Math 370 or c//. Instrumentation, data acquisition, and theory verification in the thermal and fluid sciences.

310 Manufacturing Processes 3 (2-3) Prereq MSE 201, major in engineering. Manufacturing processes, material fabrication, and nontraditional processing; manufacturing processes laboratory in machining, joining, forming; manufacturing project.

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475 Manufacturing Enterprise Systems -- Automation and Product Realization 3 (2-3) Prereq MME computer programming course; M E 316. Manufacturing automation and product realization; role of information technology and electronic data in manufacturing enterprise systems; product life-cycle management (PLM) and related tools and processes; sustainable and green manufacturing.

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483 Topics in Mechanical Engineering V 1 (0-4) to 4 (0-12) May be repeated for credit; cumulative maximum 7 hours. Contemporary topics in materials engineering.

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520 Multiscale Modeling in Thermomechanics of Materials 3 Prereq graduate standing or permission of instructor. Multiscale problems in thermomechanics of materials; practical and computational aspects of homogenization, granular materials, dislocation plasticity and atomistic methods.

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600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Mechanical Engineering

MATH

540 Applied Mathematics I 3 Prereq Math 315, graduate standing. Graduate-level counterpart of Math 440; additional requirements. Credit not granted for both Math 440 and 540.

Mechanical Engineering

Degree offered: Master of Science in Mechanical Engineering - Non Thesis

Faculty working with graduate students: 31

Graduate students: 18

Program offered: Pullman, Tri-Cities

Tests required: GRE (Quantitative), GRE (Verbal), TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

Of the minimum 27 graded credit hours, the student must take 1) 3 credit hours of Math 540, 2) a minimum of 12 credit hours of 500-level ME courses, and 3) 12 credit hours of additional courses approved by the student's advisor. Note: a maximum of 9 credit hours of graded coursework at the 300- and 400-level can be included in the program. Also required: 1) a minimum of 4 credit hours of ME 702 and 2) 2 credit hours of ME 598 (seminar; Pullman students only). All programs must have a minimum total credits of 30.

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Training and Professional Development Opportunities

Our School offers state-of-the-art research facilities enabling students to work on cutting-edge research over a wide range of topics, presenting and publishing results along with our world-class faculty. Leadership, communication, and instructional experience can be gained by PhD students through the option of serving as a teaching assistant for one or more courses during their program. Serving on University committees promotes professional development. Presenting papers at or attending regional conferences and international conferences and proceedings enriches scholarly development. Low-cost or free workshops on grant writing and leadership/professional development are routinely offered by the University. Opportunities exist for internships in industry and national labs.

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University research and teaching positions, research positions in national laboratories, postdoctoral positions in national laboratories, and technical positions in leading companies.

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Recent graduates are working at Boeing, Hewlett-Packard, Hitachi, Intel, Lawrence Livermore National Laboratory, Los Alamos National Laboratory, Micron Technology, PACCAR, Pacific Northwest National Laboratory, Parametric Technology Corp, Tektronix, U.S. Army, ARDEC, Boise State University, Princeton University, University of California Berkeley, University of Kentucky, University of New Mexico, and Sandia National Laboratory.

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Mechanical Engineering

M E

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439 Applied Aerodynamics 3 Prereq M E 303. Aerodynamic lift and drag; circulation; boundary layers, application to subsonic aircraft wing design.

449 Mechanical Vibration 3 Prereq M E 348. Vibrating systems and noise producing mechanisms; design for noise and vibration control.

461 Introduction to Nuclear Engineering 3 Prereq junior or senior standing in engineering or physical sciences; Math 315 or equivalent. Applied nuclear physics; application to the nuclear fuel cycle and nuclear reactor core design; nuclear reactor systems and safety.

472 Finite Element Methods in Design 3 Prereq M E 414. Design of selected mechanical systems components using finite element analysis.

473 Advanced CAD and Geometric Modeling 3 (2-3) Prereq M E 316. Parametric and feature based CAD/CAM; geometric modeling and its mathematical basis; integration of CAD with design processes and other software.

474 Design for Manufacture and Modern Manufacturing Strategies 3 Prereq M E 310. Design for manufacture and assembly; modern manufacturing philosophies and practices; lean manufacturing; manufacturing cost and time analysis; quality control.

475 Manufacturing Enterprise Systems -- Automation and Product Realization 3 (2-3) Prereq MME computer programming course; M E 316. Manufacturing automation and product realization; role of information technology and electronic data in manufacturing enterprise systems; product life-cycle management (PLM) and related tools and processes; sustainable and green manufacturing.

481 Control Systems 3 Prereq M E 348. Analysis and design of feedback control systems.

483 Topics in Mechanical Engineering V 1 (0-4) to 4 (0-12) May be repeated for credit; cumulative maximum 7 hours. Contemporary topics in materials engineering.

501 Continuum Mechanics 3 Prereq graduate standing. Unified presentation of principles common to all branches of solid and fluid mechanics; viscous fluids, elasticity, viscoelasticity, and plasticity.

509 MEMS Engineering 3 (2-3) Prereq graduate standing or permission of instructor. Introduction to the design, fabrication and application of microelectromechanical systems.

513 Crystal Plasticity 3 Prereq Math 440. Same as MSE 513.

514 Thermodynamics of Solids 3 Same as MSE 514.

515 Advanced Heat Transfer 3 Derivation of the energy conservation equation; laminar and turbulent forced convection heat transfer with internal and external flow; free convection.

516 Conduction and Radiation Heat Transfer 3 Prereq M E 404. Principles of conduction and radiation heat transfer with focus on solving conduction and radiation problems of engineering interest.

517 Thin Films 3 Prereq graduate standing or senior in engineering or science. Same as MSE 517.

520 Multiscale Modeling in Thermomechanics of Materials 3 Prereq graduate standing or permission of instructor. Multiscale problems in thermomechanics of materials; practical and computational aspects of homogenization, granular materials, dislocation plasticity and atomistic methods.

521 Fundamentals of Fluids I 3 Prereq C E 315 or M E 303. Governing equations of fluid mechanics accompanied by applications of Navier-Stokes equation to simple flow situations, boundary layer analysis.

523 Engineering Acoustics 3 Prereq graduate standing. Fundamentals of acoustics including wave theory; transmission through layers; generation and reception, low frequency models; application to sound measurement, transducers, loudspeaker cabinet design, and nondestructive testing; acoustic design project required.

525 Biomechanics 3 Prereq B E 320, C E 215 or MSE 301; Math 315. Same as B E 525.

527 Macroscopic Thermodynamics 3 Advanced thermodynamics from macroscopic viewpoint; basic postulates, equilibrium, stability, property relations; application to thermal-fluid and solid mechanics; irreversible thermodynamics.

530 Elasticity 3 Prereq M E 414; graduate standing. Theory of kinematics of solid deformable bodies; conservation laws applied to an elastic continuum; generalized linear stress-strain behavior with applications.

531 Theory of Plasticity 3 The fundamentals of the theory of plasticity; the classical theory of plasticity; the classical theory and modern continuum theories of large elasto-plastic deformations.

532 Finite Elements 3 Same as C E 532.

534 Mechanics of Composite Materials 3 Prereq M E 414. Analysis of micromechanical and macromechanical behavior of composite materials with emphasis on fiber-reinforced composite; prediction of properties; stiffness and strength theories; laminated beams and plates; dynamic behavior; environmental effects.

537 Fracture Mechanics and Mechanisms 3 Same as MSE 537.

540 Advanced Dynamics of Physical Systems 3 Newtonian dynamics, rotating coordinate systems; Lagrangian and Hamiltonian mechanics; gyroscopic mechanics, other applications.

556 Numerical Modeling in Fluid Mechanics 3 Prereq C E 315. Fundamental concepts in development of numerical models for fluid flow with applications to steady and unsteady flows.

574 Foundations of CAD 3 Topics fundamental to the creation of CAD, engineering visualization, and virtual reality based engineering software.

575 Geometric Modeling 3 Study of the mathematics behind the creation of complex shapes for CAD using curves, surfaces, and solids.

579 Advanced Topics in Mechanical Engineering V 1-3 May be repeated for credit.

598 Seminar 1 May be repeated for credit. Current research interests.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Mechanical Engineering

MATH

540 Applied Mathematics I 3 Prereq Math 315, graduate standing. Graduate-level counterpart of Math 440; additional requirements. Credit not granted for both Math 440 and 540.

Mechanical Engineering - Vancouver

Degree offered: Master of Science in Mechanical Engineering

Faculty working with graduate students: 8

Graduate students: 12

Graduate students receiving assistantships or scholarships: 50%

Program offered: Vancouver

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

Four credit hours of Mech 700 Masters Research and Examination required. Additional credits are required in consultation with the academic advisor to total 30 credit hours. Two credits of Mech 700 must be taken during the term in which the student intends to defend the thesis.

Program Description

The Master of Science in Mechanical Engineering program in the School of ENCS is a thesis program and requires a minimum of 30 credit hours. This includes 21 hours of graded coursework beyond the bachelor's plus a minimum of 4 thesis credits. The coursework and research are in the general areas of dynamics, robotics, solid mechanics, manufacturing and design, fluid dynamics, heat and mass transfer and micro and nanotechnology. Our laboratories are equipped with state-of-the-art equipment worth more than $6 million. Teaching and research assistantships are available for qualified students. A Bachelor of Science degree from an accredited program in mechanical engineering provides a good background for the MSME graduate pro-

gram. Students with bachelor degrees in other engineering disciplines, mathematics, and the physical sciences are routinely admitted, but may be required to make up requisite undergraduate deficiencies. An undergraduate grade point average of 3.0 is a minimum for admission to the MS program.

Degree Description

The Master of Science in Mechanical Engineering program in the School of ENCS is a thesis program and requires a minimum of 30 credit hours. This includes 21 hours of graded coursework beyond the bachelor's plus a minimum of 4 thesis credits. The coursework and research are in the general areas of dynamics, robotics, solid mechanics, manufacturing and design, fluid dynamics, heat and mass transfer and micro and nanotechnology. Our laboratories are equipped with state-of-the-art equipment worth more than $6 million. Teaching and research assistantships are available for qualified students. A Bachelor of Science degree from an accredited program in mechanical engineering provides a good background for the MSME graduate program. Students with bachelor degrees in other engineering disciplines, mathematics, and the physical sciences are routinely admitted, but may be required to make up requisite undergraduate deficiencies. An undergraduate grade point average of 3.0 is a minimum for admission to the MS program.

Contact Information

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Faculty

Xiaolin Chen, Berat Gurocak, Dae-Wook Kim, Yoon Kim, Hamid Rad, Stephen Solovitz, Jie Xu and Wei Xue.

MATH

540 **Applied Mathematics I** 3 Prereq Math 315, graduate standing. Graduate-level counterpart of Math 440; additional requirements. Credit not granted for both Math 440 and 540.

MECH

405 **Introduction to Microcontrollers** 3 Prereq CS 251; Mech 304. Microcontroller architecture, microcontroller programming, mechanical system design with embedded microcontrollers.

431 **Semiconductor Devices** 3 Prereq Chem 105; Phys 202. Crystal properties, energy bands, semiconductor charge carriers, p-n junctions, field-effect transistors, bipolar junction transistors, optoelectronic devices, integrated circuits.

438 **Microfabrication Technology** 3 Prereq Chem 105; Math 315; Phys 202. Microelectronic fabrication technology, semiconductor material, diffusion, thermal oxidation, ion implantation, lithography, etching, thin film deposition, CMOS integration and MEMS. Credit not granted for both Mech 438 and 538.

442 **Advanced Thermal Systems** 3 Prereq Mech 404. Analysis and design of advanced thermal systems at macro, mini and micro scales; applied design software packages; design projects. Credit not granted for both Mech 442 and 542.

450 **Advanced Topics in Micro and Nano Technology** 3 (2-3) Prereq Chem 106; Phys 202. Microfabrication technology, bulk and surface micromachining, sensors and actuators, microelectromechanical systems (MEMS), nanofabrication technology, micro/nano scale material and device measurements. Credit not granted for both Mech 450 and 550.

467 **Automation** 3 (2-3) Prereq Mech 348. Automation systems, discrete event control using programmable logic controllers (PLC), robot programming, process control. Credit not granted for both Mech 467 and 567.

468 **Robotics** 3 Prereq Mech 348. Industrial robots, kinematics, control, robot programming, interfacing, sensors, actuators, vision systems and mobile robots. Credit not granted for both Mech 468 and 568.

476 **Advanced Manufacturing Engineering** 3 Prereq Mech 310. Advanced topics in manufacturing processes, including interrelationships between the properties of the material, the manufacturing process and design of components. Credit not granted for both Mech 476 and 576.

485 **Computer-aided Engineering** 3 Prereq Mech 215; Mech 310 or c//. Introduction to the use of finite element techniques in engineering product design and analysis; basic concepts and applications in CAE. Credit not granted for both Mech 485 and 585.

489 **Material Failure in Mechanical Design** 3 Prereq Mech 215; Mech 309. Analysis, design and prevention from failure of materials in mechanical design; mechanical behavior of materials such as fatigue, fracture and wear. Credit not granted for both Mech 489 and 589.

509 **MEMS Engineering** 3 (2-3) Introduction to the design, fabrication and application of microelectromechanical systems.

515 **Advanced Heat Transfer** 3 Energy conservation equations; forced convection with internal and external flow, free convection, boiling and condensation, mass transfer, numerical methods.

521 **Fundamentals of Fluids I** 3 Mass and momentum conservation equations, Navier-Stokes equations, compressible flows, inviscid-potential flows, advanced viscous flows including boundary layer numerical methods.

532 **Finite Elements** 3 Theory of finite elements; applications to general engineering systems considered as assemblages of discrete elements.

538 **Microfabrication Technology** 3 (2-3) Graduate-level counterpart of Mech 438; additional requirements. Credit not granted for both Mech 438 and 538.

540 **Advanced Dynamics** 3 Newtonian dynamics, rotating coordinate systems; Lagrangian and Hamiltonian mechanics, gyroscopic mechanics, other applications.

542 **Advanced Thermal Systems** 3 Graduate-level counterpart of Mech 442; additional requirements. Credit not granted for both Mech 442 and 542.

550 **Micro and Nano Technology** 3 (2-3) Graduate-level counterpart of Mech 450; additional requirements. Credit not granted for both Mech 450 and 550.

567 **Automation** 3 (2-3) Graduate-level counterpart of Mech 467; additional requirements. Credit not granted for both Mech 467 and 567.

568 **Robotics** 3 Graduate-level counterpart of Mech 468; additional requirements. Credit not granted for both Mech 468 and 568.

576 **Advanced Manufacturing Engineering** 3 Graduate-level counterpart of Mech 476; additional requirements. Credit not granted for both Mech 476 and 576.

579 **Advanced Topics in Design and Manufacturing** V 1-3 May be repeated for credit.

589 Material Failure in Mechanical Design 3 Graduate-level counterpart of Mech 489; additional requirements. Credit not granted for both Mech 489 and 589.

598 Seminar 1 May be repeated for credit. Current research interests.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Molecular Biosciences - Cert in Mol Bio Sci

Degree offered: Graduate Certificate in Molecular Biosciences

Faculty working with graduate students: 51

Graduate students: 1

Program offered: DDP, Pullman

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

Students must complete a total of 11-12 credits of graded coursework made up of required and elective courses of which 9 credits are core/required and 2-3 credits are electives.

Program Description

Faculty in the School of Molecular Biosciences (SMB) explore the cellular, molecular, and structural basis of processes essential for proper function of bacteria, archaea, and eukaryota. The Ph.D. and M.S. degrees in SMB are interdisciplinary degrees in Molecular Biosciences. Trainees for Ph.D. and Master's degrees will choose one of three discipline-specific tracks in Biochemistry, Genetics, or Microbiology to ensure that their interdisciplinary training in molecular, cellular and structural biology builds on a solid discipline-specific foundation. The Professional Science Master's (PSM) within Molecular Biosciences is designed to help students transition into the workplace by training them in skills that employers need. This master's degree (PSM) combines science with training in ethics and business, bridging the gap between academia and the workplace. An important career-oriented aspect of the program is that it requires an internship with practical training, rather than a thesis. In addition, SMB offers a Graduate Certificate in Molecular Biosciences. This certificate is geared for working professionals who seek additional training or educators requiring continued education for accreditation.

Degree Description

SMB offers a Graduate Certificate in Molecular Biosciences. This certificate is geared for working professionals who seek additional training or educators requiring continued education for accreditation.

Training and Professional Development Opportunities

Completion of the graduate certificate courses will be invaluable in career development in many different interdisciplinary fields.

Post-Graduate Employment Opportunities

Hoping this will aid people in their continuing education credits to promote themselves during employment.

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MBIOS

501 Cell Biology 3 Prereq MBioS 301, 303, or graduate standing; c// with MBioS 529 highly recommended. Graduate-level counterpart of MBioS 401; additional requirements. Credit not granted for both MBioS 401 and 501.

503 Molecular Biology I 3 Prereq MBioS 301, 303, or graduate standing. DNA replication and recombination in prokaryotes and eukaroytes; recombinant DNA methods and host/vector systems; genome analysis; transgenic organisms.

513 General Biochemistry I 3 Prereq MBioS 303, graduate standing. Graduate-level counterpart of MBioS 413; additional requirements. Credit not granted for both MBioS 413 and 513.

578 Bioinformatics 3 (2-3) Prereq MBioS 301, 303, or Cpt S 355; graduate standing. Graduate-level counterpart of MBioS 478; additional requirements. Credit not granted for both 478 and 578.

PHIL

530 Bioethics 2 Prereq graduate standing. Professional ethics for scientists; ethical implications of new technologies; obligations to human and non-human research subjects.

STAT

412 Statistical Methods in Research I 3 Prereq Stat 212, Math 140, 171, 202, or graduate standing. Intermediate statistical methods, design and analysis of research studies: completely randomized and randomized block designs, multiple regression, categorical data analysis.

Molecular Biosciences

Degree offered: Doctor of Philosophy (Molecular Biosciences)

Faculty working with graduate students: 42

Graduate students: 43

Graduate students receiving assistantships or scholarships: 100%

Tests required: TOEFL, TOEFLI, GRE (Quantitative), GRE (Verbal)

Deadline: Fall: December 15

Requirements

Students admitted to the Ph.D. program will be required to complete the required coursework, two proposals and three departmental seminars in addition to the submission of a final dissertation and dissertation defense.

Program Description

Faculty in the School of Molecular Biosci-

ences (SMB) explore the cellular, molecular, and structural basis of processes essential for proper function of bacteria, archaea, and eukaryota. The Ph.D. and M.S. degrees in SMB are interdisciplinary degrees in Molecular Biosciences. Trainees for Ph.D. and Master's degrees will choose one of three discipline-specific tracks in Biochemistry, Genetics, or Microbiology to ensure that their interdisciplinary training in molecular, cellular and structural biology builds on a solid discipline-specific foundation. The Professional Science Master's (PSM) within Molecular Biosciences is designed to help students transition into the workplace by training them in skills that employers need. This master's degree (PSM) combines science with training in ethics and business, bridging the gap between academia and the workplace. An important career-oriented aspect of the program is that it requires an internship with practical training, rather than a thesis. In addition, SMB offers a Graduate Certificate in Molecular Biosciences. This certificate is geared for working professionals who seek additional training or educators requiring continued education for accreditation.

Degree Description

A Ph.D. interdiciplinary degree in Molecular Biosciences with tracks in Biochemistry, Genetics and Cell Biology and Microbiology

Training and Professional Development Opportunities

Molecular Biosciences is a dynamic continuum of disciplines which uses the approaches of chemistry, physics, and biology to understand the fundamental mechanisms of living organisms. The School of Molecular Biosciences offers many exciting opportunities for graduate students to explore the vast range of life science research while working toward degrees in the sub-disciplines of biochemistry, biophysics, cell biology, genetics, and microbiology. Entering students do rotations through research laboratories to choose a thesis advisor. Over 30 research laboratories are associated with the School of Molecular Biosciences, investigating problems in diverse systems, including bacteria, yeast, plants, and animals. Graduates acquire a breadth and depth of knowledge that allows them to adapt quickly to new information and approaches developed in the rapidly changing field of molecular biosciences.

Post-Graduate Employment Opportunities

Alumni have gone on to high-profile postdoctoral opportunities and successful careers in academic and industrial sciences, especially in the biotechnology industry. Career opportunities include positions in food, agricultural, pharmaceutical, and biotechnology industries, private or government laboratories and departments, and nonprofit institutions such as clinical and hospital laboratories and research institutes. With the advent of the "biological revolution," which will continue well into the 21st century, new opportunities with links to the worlds of public health, business, law, and government are ever expanding.

Post-Graduate Career Placements

Postdoctoral positions in nationally renowned laboratories at University of California, Berkeley, California Institute of Technology, University of Colorado Health Sciences Center, University of Minnesota, University of Pennsylvania Wistar Institute, Washington University in St. Lois, Stanford University, Johns Hopkins University, the Mayo Institute, and the Fred Hutchinson Cancer Research Center.Faculty positions at tier-one research universities and outstanding undergraduate institutions such as the University of Kansas, University of Minnesota, Texas Tech, and the U.S. Naval Acadamy.Industrial positions at Amgen, Battelle, Infections Disease Research Institute, Kemin Industries, Miltenyi Biotechnology, Myriad Genetics, PathoGenesis, and Sunesis.

Contact Information

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MBIOS

501 **Cell Biology** 3 Prereq MBioS 301, 303, or graduate standing; c// with MBioS 529 highly recommended. Graduate-level counterpart of MBioS 401; additional requirements. Credit not granted for both MBioS 401 and 501.

503 **Molecular Biology I** 3 Prereq MBioS 301, 303, or graduate standing. DNA replication and recombination in prokaryotes and eukaroytes; recombinant DNA methods and host/vector systems; genome analysis; transgenic organisms.

504 **Molecular Biology II** 3 Prereq MBioS 301, 303, or graduate standing. Gene expression and regulation in prokaryotes and eukaryotes, including transcription, RNA processing, and translation; chromatin structure; DNA repair.

507 **Critical Analysis of Scientific Literature** 2 Prereq MBioS 503; MBioS 513 or c//. Dissection and discussion of current molecular bioscience papers to foster development of critical reading of primary literature.

508 **Quantitative Approaches in Molecular Biosciences** 2 Prereq one semester of calculus, MBioS 513, 507. Quantitative methods and techniques using examples from the current molecular biosciences primary literature.

513 **General Biochemistry I** 3 Prereq MBioS 303, graduate standing. Graduate-level counterpart of MBioS 413; additional requirements. Credit not granted for both MBioS 413 and 513.

514 **General Biochemistry** 3 Prereq MBioS 413, or graduate standing. Graduate-level counterpart of MBioS 414; additional requirements. Credit not granted for both 414 and 514.

550 **Microbial Physiology** 3 Prereq MBioS 303, MBioS 305 and 306, or graduate standing. Graduate-level counterpart of MBioS 450; additional requirements. Credit not granted for both MBioS 450 and 550.

PHIL

530 **Bioethics** 2 Prereq graduate standing. Professional ethics for scientists; ethical implications of new technologies; obligations to human and non-human research subjects.

Molecular Biosciences

Degree offered: Master of Science in Molecular Biosciences

Faculty working with graduate students: 51

Graduate students: 43

Graduate students receiving assistantships or scholarships: 100%

Tests required: TOEFL, TOEFLI, GRE (Quantitative), GRE (Verbal)

Deadline: Fall: December 15

Requirements

Students admitted to the Master of Sciences in Molecular Biosciences, thesis, program will be required to complete the required coursework, first proposal and one departmental seminar in addition to the submission of a final thesis and thesis defense.

Program Description

Faculty in the School of Molecular Biosciences (SMB) explore the cellular, molecular, and structural basis of processes essential for proper function of bacteria, archaea, and eukaryota. The Ph.D. and M.S. degrees in SMB are interdisciplinary degrees in Molecular Biosciences. Trainees for Ph.D. and Master's degrees will choose one of three discipline-specific tracks in Biochemistry, Genetics, or Microbiology to ensure that their interdisciplinary training in molecular, cellular and structural biology builds on a solid discipline-specific foundation. The Professional Science Master's (PSM) within Molecular Biosciences is designed to help students transition into the workplace by training them in skills that employers need. This master's degree (PSM) combines science with training in ethics and business, bridging the gap between academia and the workplace. An important career-oriented aspect of the program is that it requires an internship with practical training, rather than a thesis. In addition, SMB offers a Graduate Certificate in Molecular Biosciences. This certificate is geared for working professionals who seek additional training or educators requiring continued education for accreditation.

Degree Description

A Master of Science in Molecular Biosciences - thesis - interdiciplinary degree in Molecular Biosciences with tracks in Biochemistry, Genetics and Cell Biology and Microbiology.

Training and Professional Development Opportunities

Molecular Biosciences is a dynamic continuum of disciplines which uses the approaches of chemistry, physics, and biology to understand the fundamental mechanisms of living organisms. The School of Molecular Biosciences offers many exciting opportunities for graduate students to explore the vast range of life science research while working toward degrees in the sub-disciplines of biochemistry, biophysics, cell biology, genetics, and microbiology. Entering students do rotations through research laboratories to choose a thesis advisor. Over 30 research laboratories are associated with the School of Molecular Biosciences, investigating problems in diverse systems, including bacteria, yeast, plants, and animals. Graduates acquire a breadth and depth of knowledge that allows them to adapt quickly to new information and approaches developed in the rapidly changing field of molecular biosciences.

Post-Graduate Employment Opportunities

Alumni have gone on to opportunities and successful careers in academic and industrial science, especially in the biotechnology industry. Career opportunities include positions in food, agricultural, pharmaceutical, and biotechnology industries, private or government laboratories and departments, and nonprofit institutions such as clinical and hospital laboratories and research institutes. With the advent of the "biological revolution," which will continue well into the 21st century, new opportunities with links to the worlds of public, health, business, law, and government are ever expanding.

Post-Graduate Career Placements

Master degree alumni have received many placements including the following: pursuing higher education degrees at Gonzaga University, School of Law; Washington State University, College of Veterinary Medicine; doctorial programs at Pennsylvania State University, Taiwan University, University of Denver; California State University, Davis; and many others. Alums have also gone into industry to renowned laboratories at Amgen, Fred Hutchinson Cancer Research Center, Battelle, Pacific Northwest Research Labs; Infectious Disease Research Institute, Seattle; and many academic research labs.

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MBIOS

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513 **General Biochemistry I** 3 Prereq MBioS 303, graduate standing. Graduate-level counterpart of MBioS 413; additional requirements. Credit not granted for both MBioS 413 and 513.

514 **General Biochemistry** 3 Prereq MBioS 413, or graduate standing. Graduate-level counterpart of MBioS 414; additional requirements. Credit not granted for both 414 and 514.

550 **Microbial Physiology** 3 Prereq MBioS 303, MBioS 305 and 306, or graduate standing. Graduate-level counterpart of MBioS 450; additional requirements. Credit not granted for both MBioS 450 and 550.

PHIL

530 **Bioethics** 2 Prereq graduate standing. Professional ethics for scientists; ethical implications of new technologies; obligations to human and non-human research subjects.

Molecular Biosciences

Degree offered: Master of Science in Molecular Biosciences - Non Thesis

Faculty working with graduate students: 51

Graduate students: 43

Graduate students receiving assistantships or scholarships: 100%

Tests required: GRE (Quantitative), GRE (Verbal), TOEFL, TOEFLI

Deadline: Fall: December 15

Requirements

Students admitted to the Master of Sciences in Molecular Biosciences, non-thesis, program will be required to complete the required coursework, first proposal and one departmental seminar in addition to the submission of a project and project defense.

Program Description

Faculty in the School of Molecular Biosciences (SMB) explore the cellular, molecular, and structural basis of processes essential for proper function of bacteria, archaea, and eukaryota. The Ph.D. and M.S. degrees in SMB are interdisciplinary degrees in Molecular Biosciences. Trainees for Ph.D. and Master's degrees will choose one of three discipline-specific tracks in Biochemistry, Genetics, or Microbiology to ensure that their interdisciplinary training in molecular, cellular and structural biology builds on a solid discipline-specific foundation. The Professional Science Master's (PSM) within Molecular Biosciences is designed to help students transition into the workplace by training them in skills that employers need. This master's degree (PSM) combines science with training in ethics and business, bridging the gap between academia and the workplace. An important career-oriented aspect of the program is that it requires an internship with practical training, rather than a thesis. In addition, SMB offers a Graduate Certificate in Molecular Biosciences. This certificate is geared for working professionals who seek additional training or educators requiring continued education for accreditation.

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Training and Professional Development Opportunities

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Master degree alumni have received many placements including the following: pursuing higher education degrees at Gonzaga University, School of Law; Washington State University, College of Veterinary Medicine; doctorial programs at Pennsylvania State University, Taiwan University, University of Denver; California State University, Davis; and many others. Alums have also gone into industry to renowned laboratories at Amgen, Fred Hutchinson Cancer Research Center, Battelle, Pacific Northwest Research Labs; Infectious Disease Research Institute, Seattle; and many academic research labs.

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Faculty

John Alderete, Wenfeng An, Margaret Black, Kelly Brayton, Laurence Brewer, Ronald Brosemer, Wendy Brown, John Browse, Douglas Call, Weihang Chai, Cynthia Cooper, William Davis, Todd Farmerie, Lisa Gloss, Michael Griswold, Joseph Harding, Cynthia Haseltine, Terry Hassold, Consetta Helmick, Chengtao Her, Patricia Hunt, Mary Hunzicker-Dunn, Michael Kahn, Chulhee Kang, Kwanhee Kim, Michael Konkel, Bernd Lange, Mary Lanier, Laura Lavine, Nancy Magnuson, Norah McCabe, Danny Mitchell, Philip Mixter, Subra Muralidharan, John Nilson, Carl Peters, Raymond Reeves, Kenneth Roberts, Buel Rodgers, James Schenk, Eric Shelden, Michael Smerdon, Julie Stanton, Linda Thomashow, Gary Thorgaard, Grant Trobridge, Susan Wang, Jennifer Watts, John Wyrick, Luying Xun and Ping Ye.

MBIOS

501 **Cell Biology** 3 Prereq MBioS 301, 303, or graduate standing; c// with MBioS 529 highly recommended. Graduate-level counterpart of MBioS 401; additional requirements. Credit not granted for both MBioS 401 and 501.

503 **Molecular Biology I** 3 Prereq MBioS 301, 303, or graduate standing. DNA replication and recombination in prokaryotes and eukaroytes; recombinant DNA methods and host/vector systems; genome analysis; transgenic organisms.

504 **Molecular Biology II** 3 Prereq MBioS 301, 303, or graduate standing. Gene expression and regulation in prokaryotes and eukaryotes, including transcription, RNA processing, and translation; chromatin structure; DNA repair.

507 **Critical Analysis of Scientific Literature** 2 Prereq MBioS 503; MBioS 513 or c//. Dissection and discussion of current molecular bioscience papers to foster development of critical reading of primary literature.

508 Quantitative Approaches in Molecular Biosciences 2 Prereq one semester of calculus, MBioS 513, 507. Quantitative methods and techniques using examples from the current molecular biosciences primary literature.

513 General Biochemistry I 3 Prereq MBioS 303, graduate standing. Graduate-level counterpart of MBioS 413; additional requirements. Credit not granted for both MBioS 413 and 513.

514 General Biochemistry 3 Prereq MBioS 413, or graduate standing. Graduate-level counterpart of MBioS 414; additional requirements. Credit not granted for both 414 and 514.

550 Microbial Physiology 3 Prereq MBioS 303, MBioS 305 and 306, or graduate standing. Graduate-level counterpart of MBioS 450; additional requirements. Credit not granted for both MBioS 450 and 550.

PHIL

530 Bioethics 2 Prereq graduate standing. Professional ethics for scientists; ethical implications of new technologies; obligations to human and non-human research subjects.

Molecular Biosciences - Professional

Degree offered: Master of Science in Molecular Biosciences - Professional (Non Thesis)

Faculty working with graduate students: 47

Graduate students: 5

Program offered: DDP, Pullman

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Program Description

The Professional Science Master's (PSM) in molecular biosciences is designed to help students transition into the workplace by training them in skills that employers need. The interdisciplinary option is available online, or students can choose to take some courses on the Pullman campus.The PSM combines science with training in ethics and business, bridging the gap between academia and the workplace. One career-oriented aspect of the program is that it requires an internship with a business rather than a thesis. The nationwide shortage of scientists with managerial and business training means PSM graduates will be well positioned for employment.

Degree Description

The Professional Science Master's (PSM) within Molecular Biosciences is designed to help students transition into the workplace by training them in skills that employers need. This master's degree (PSM) combines science with training in ethics and business, bridging the gap between academia and the workplace. An important career-oriented aspect of the program is that it requires an internship with practical training, rather than a thesis.

Contact Information

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Faculty

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ENTRP

486 Topics in New Venture Business Planning 3 Prereq Fin 325; Mktg 360; MgtOp 301; MIS 375. Business competition to understand new venture creation utilizing technology breakthroughs, entrepreneurial business functions, and business plan development.

MBIOS

501 Cell Biology 3 Prereq MBioS 301, 303, or graduate standing; c// with MBioS 529 highly recommended. Graduate-level counterpart of MBioS 401; additional requirements. Credit not granted for both MBioS 401 and 501.

503 Molecular Biology I 3 Prereq MBioS 301, 303, or graduate standing. DNA replication and recombination in prokaryotes and eukaroytes; recombinant DNA methods and host/vector systems; genome analysis; transgenic organisms.

504 Molecular Biology II 3 Prereq MBioS 301, 303, or graduate standing. Gene expression and regulation in prokaryotes and eukaryotes, including transcription, RNA processing, and translation; chromatin structure; DNA repair.

513 General Biochemistry I 3 Prereq MBioS 303, graduate standing. Graduate-level counterpart of MBioS 413; additional requirements. Credit not granted for both MBioS 413 and 513.

514 General Biochemistry 3 Prereq MBioS 413, or graduate standing. Graduate-level counterpart of MBioS 414; additional requirements. Credit not granted for both 414 and 514.

574 Protein Biotechnology 3 Prereq MBioS 513 or c//. Biotechnology related to the isolation, modification and large scale commercial production, patenting and marketing of useful recombinant proteins and products.

578 Bioinformatics 3 (2-3) Prereq MBioS 301, 303, or Cpt S 355; graduate standing. Graduate-level counterpart of MBioS 478; additional requirements. Credit not granted for both 478 and 578.

PHIL

530 Bioethics 2 Prereq graduate standing. Professional ethics for scientists; ethical implications of new technologies; obligations to human and non-human research subjects.

STAT

512 Statistical Methods in Research II 3 (2-2) Prereq Stat 412 or equivalent. Analysis and interpretation of designed experiments: CRD, RCBD, spit-plot and repeated measures, multiple comparisons, multiple regression modeling, validation of assumptions.

Molecular Plant Sciences

Degree offered: Doctor of Philosophy (Molecular Plant Sciences)

Faculty working with graduate students: 39

Graduate students: 50

Graduate students receiving assistantships or scholarships: 100%

Tests required: GRE (Quantitative), GRE (Verbal), TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Program Description

The research goal of this program is to understand how plants work, from basic biochemistry to the physiology of living plants in the field, impacting fundamental understanding of plants, their productivity, and impacts on the global economy and climate. To tackle such large interdisciplinary issues, MPS brings together world experts in diverse fields of plant sciences and a range of departments, encouraging collaborations that span multiple disciplines. MPS faculty are housed in many departments, including the Institute of Biological Chemistry, Crop and Soil Sciences, Horticulture and Landscape Architecture, Plant Pathology, the School of Biological Sciences, and the School of Molecular Biosciences. Each faculty member is strongly committed to graduate education and research and runs an internationally-recognized, well-funded and dynamic research program.The program itself is designed to give you the deep and broad experiences in research required to become a highly successful researcher in highly competitive fields of plant sciences. Our philosophy of education is that scientific principles are best learned in the context of individual scientific research, and thus our program emphasizes learning through your thesis project. In particular, the Accelerated Research Ph.D. option is designed to place students in their thesis laboratories up to a year earlier than other programs. This allows students to pursue their research interests more rapidly and in greater depth, leading to higher research productivity that will help our graduates to be more competitive in their careers.Solving scientific problems in modern plant biology can involve many disciplines, from basic biochemistry and biophysics to genomics, proteomics, bioinformatics, plant physiology, and ecophysiology. Individual students' coursework is targeted to enhance their research progress while providing the broad basic scientific foundation needed to understand the wider implications of their research.

Degree Description

Graduate study leading to the Doctor of Philosophy degree is offered as an interdepartmental curriculum by graduate faculty from the Departments of Crop and Soil Science, Food Science and Human Nutrition, Electrical Engineering and Computer Science, Horticulture and Landscape Architecture, Molecular Biosciences, Plant Pathology, Biological Sciences, and the Institute of Biological Chemistry. The objectives of the program are to provide the graduate student with a broad knowledge in molecular plant sciences and with research experience in a chosen area within this discipline. Specialization includes cellular and subcellular physiology, the molecular biology and biochemistry of plant-related processes, photosynthesis and photorespiration, nitrogen fixation, phytochemistry, the physiology of vascular plants, metabolism, plant pathogen interactions, hormonal interactions and regulation of growth, crop production physiology, and physiological ecology as well as related areas in agriculture and biology.Students entering the program must have completed their baccalaureate degree with training in one year each of elementary biology or botany, and physics, chemistry through one semester of organic chemistry and biochemistry, one semester each of molecular plant sciences and genetics, and mathematics (through calculus). Limited undergraduate deficiencies may be remedied by taking the appropriate courses upon enrollment in the graduate program on a provisional basis. Degree requirements include courses in molecular biology, advanced molecular plant sciences, plant morphology and anatomy, and metabolism. To meet the minimum requirements of core course credit in the Graduate School, elective courses are chosen as approved by the student's advisor and the supervising committee of graduate faculty. There is no foreign language requirement. Course requirements are drawn from existing courses offered by MPS and cooperating departments and programs. In addition, a seminar is held weekly during each semester.Policies and procedures of the Graduate School apply to all admissions. Interested students may direct their inquiries to Molecular Plant Sciences or to any participating faculty member. Should the latter route be followed, preference for the Program in Molecular Plant Sciences must be indicated and, if possible, the research area of interest identified.The program offers flexibility for students with varied backgrounds in chemistry, biochemistry, molecular plant sciences, molecular biology, botany, genetics, biology, and the agricultural sciences to pursue advanced training in molecular plant sciences, with independent study and original research in areas of the student's own interests as the single most important component. The interdisciplinary nature of the program assures the student of interaction with molecular plant scientists representing a wide range of research interests and provides the student with a broad choice of specialized facilities which are available in the cooperating academic units.Students are typically supported by the program during the first academic year. Financial support during subsequent years will be managed by the administering academic unit. Participating faculty may provide support through individual grants and contracts. Every effort will be made to inform applicants of these opportunities.

Training and Professional Development Opportunities

NIH Biotechnology Training Program, Achievement Rewards for College Scientists (ARCS)

Post-Graduate Employment Opportunities

Post-doctoral researcher, research institute scientist, industry scientist, assistant professor (academic track)

Contact Information

Molecular Plant Sciences Graduate Program
324 French Administration Building
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Faculty

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Molecular Plant Sciences

MPS

515 Seminar in Molecular Plant Sciences 1 May be repeated for credit; cumulative maximum 4 hours. A cross-discipline seminar, including botany, crop and soils sciences, horticulture, plant pathology, and molecular plant sciences.

525 Plant Molecular Genetics 3 graduate standing Introduction to plant genome organization and gene expression while acquiring knowledge of modern molecular techniques and experimental approaches.

570 Advanced Topics in Molecular Plant Sciences 1 May be repeated for credit; cumulative maximum 3 hours. Oral presentation of a current research paper.

571 Research Proposal 2 May be repeated for credit; cumulative maximum 4 hours. Written and oral presentation of an area of molecular plant sciences.

Music

Degree offered: Master of Arts in Music

Faculty working with graduate students: 26

Graduate students: 15

Graduate students receiving assistantships or scholarships: 80%

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

A graduate recital is required in the performance emphasis, including the conducting emphasis.

Program Description

The School of Music offers the degree Master of Arts in Music, which may be earned through studies in the areas of music education, composition, music history and literature, conducting, and performance studies. Though selection of an emphasis is not required, four emphases are available. The emphasis in music education provides advances studies for experience and prospective teachers. The emphases in performance and composition are selected by students wishing to teach at the college level or intending to enter such professions as music performance, conducting, composing and arranging. Students electing the jazz emphasis focus on one or more aspects of jazz music - performance, composition, arranging, pedagogy, or history for example - in preparation for careers in jazz. The program offers both thesis and non-thesis options, designed according to the goals of the student. Composition emphasis students must complete the thesis option. The Master of Arts in Music degree offered by the Music Program is flexible and provides students the opportunity to develop a unique program of study to satisfy individual interests and goals. The intention of the Music Program and its Graduate Faculty is to provide the best of instruction to our graduate students, maintaining the highest of standards.

Degree Description

The music program in the School of Music offers the degree of Master of Arts in music, which may be earned through study in areas of music education, composition, music history and literature, conducting, and performance studies. Four emphases are available:-Music education--Provides advanced studies for experienced or prospective teachers. -Performance--Selected by students wishing to teach at the college level or enter professions such as music performance and conducting.-Composition--prepares students to enter professions in music such as composition and arranging.-Jazz emphasis--focuses on one or more aspects of jazz - performance, composition, arranging, pedagogy, or history - in preparation for careers in jazz. The degree may also be completed without an emphasis. The program offers both thesis and non-thesis options, designed according to the goals of the student. Composition emphasis students must complete the thesis option.

Training and Professional Development Opportunities

Graduate students have opportunities to conduct and rehearse ensembles; teach undergraduate courses; perform and make recordings with world acclaimed faculty artists; prepare for major competitions in performance and composition; and tour nationally and internationally with performance ensembles. WSU graduate students have won numerous awards in major competitions for performance and composition. Recent graduates have been featured in Downbeat magazine and been successful in publishing their compositions.

Post-Graduate Career Placements

Graduate students in music have achieved teaching positions at major universities, community colleges and public schools throughout the United States, including the Director of Jazz Studies at West Valley College in Saratoga, CA; teaching position at the Joy of Music Academy in Boston; and teacher position at the American School in Rome, Italy. Other students have continued their postgraduate work at other prestigious schools of music and performed at major music festivals.

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Faculty

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MUS

362 History of Jazz 3 History of jazz in chronological sequence; social and political contexts of the African-American origins of jazz; stylistic developments.

363 Women in Music 3 Interdisciplinary examination of the way gender intersects with race and class to affect American women in music.

364 Introduction to Sound Recording Technology 3 Music, audio and recording technology throughout history and its influence on society and culture.

371 Diction for Singers I 2 Italian and English; International Phonetic Alphabet; fundamental diction principles, applied to each language and oriented to needs of the singer.

372 Diction for Singers II 2 Prereq Mus 371. French and German; International Phonetic Alphabet; fundamental diction principles, applied to each language and oriented to needs of the singer.

388 Music for the Classroom Teacher 2 For elementary education majors. Prereq Mus 153 or satisfactory score on music fundamentals test administered by music faculty; admission to Teacher Certification Program. Singing, movement, listening and instrumental methods/resources for K-8 grades.

432 University Singers 1 (0-4) May be repeated for credit. Public performance may be required.

444 Marching Band/Varsity Band 1 (0-4) May be repeated for credit. By audition only.

451 Seminar in Counterpoint 2 May be repeated for credit; cumulative maximum 4 hours. Prereq Mus 351 or c//. Contrapuntal techniques of the 16th and 18th century with original stylistic writing.

452 Electronic Music 2 (1-3) Prereq Mus 353 or c//. Introduction to computer-controlled digital, analog, and sampling synthesis; topics include sequencing, waveform editing, and creative projects.

455 Seminar in Instrumentation 2 May be repeated for credit. Prereq Mus 351 or c//. Scoring for various instrumental combinations.

458 Advanced Jazz Improvisation 2 May be repeated for credit; cumulative maximum 4 hours. Prereq Mus 258. Advanced concepts in jazz improvisation.

465 Seminar in Major Performance Literature 2 May be repeated for credit; cumulative maximum 6 hours. Prereq Mus 351 or c//. Survey/performance of solo and chamber literature for voice, keyboard, strings, winds, brass, percussion.

482 Instrumental Conducting 1 (0-3) Techniques and patterns in conducting as applied to orchestra and band literature; score preparation and rehearsal techniques for instrumental ensembles.

483 Choral Conducting 1 (0-3) Techniques and patterns in conducting as applied to choral literature; score preparation and rehearsal techniques for choral ensembles.

487 String Techniques 2 (0-6) String techniques, materials and methods for music education majors.

493 Wind and Percussion Techniques I 2 (0-6) Brass, woodwind, and percussion techniques for music education majors.

494 Wind and Percussion Techniques II 2 (0-6) Prereq Mus 493. Brass, woodwind and percussion techniques; elementary instrument conducting for music education majors.

498 Piano Pedagogy Practicum 2 May be repeated for credit; cumulative maximum 6 hours. Prereq applied piano study. Piano Pedagogy Practicum 2 Supervised teaching in Piano Preparatory Lab School, including lesson planning and meetings with coordinator for critiques and suggestions.

501 Organ 2(0-6) or 4(0-12)

502 Piano 2(0-6) or 4(0-12) May be repeated for credit.

503 Voice 2(0-6) or 4(0-12) May be repeated for credit. Prereq c// in Mus 431, 432, or by interview only.

504 French Horn 2(0-6) or 4(0-12) May be repeated for credit.

505 Trumpet 2(0-6) or 4(0-12) May be repeated for credit.

506 Trombone 2(0-6) or 4(0-12) May be repeated for credit.

507 Baritone 2(0-6) or 4(0-12) May be repeated for credit.

508 Tuba 2(0-6) or 4(0-12) May be repeated for credit.

509 Percussion 2(0-6) or 4(0-12) May be repeated for credit.

510 Violin 2(0-6) or 4(0-12) May be repeated for credit.

511 Viola 2(0-6) or 4(0-12) May be repeated for credit.

512 Violoncello 2(0-6) or 4(0-12) May be repeated for credit.

513 Contrabass 2(0-6) or 4(0-12) May be repeated for credit.

514 Flute 2(0-6) or 4(0-12) May be repeated for credit.

515 Oboe 2(0-6) or 4(0-12) May be repeated for credit.

516 Clarinet 2(0-6) or 4(0-12) May be repeated for credit.

517 Bassoon 2(0-6) or 4(0-12) May be repeated for credit.

518 Saxophone 2(0-6) or 4(0-12) May be repeated for credit.

519 Secondary Performance Study 1 or 2 May be repeated for credit; cumulative maximum 6 hours. Prereq bachelor's degree in music. Instruction on instruments or voice other than major performing medium.

522 Graduate Recital 2 May be repeated for credit; cumulative maximum 4 hours. Private screening and public performance as required within each performance emphasis.

528 Opera Workshop 1 (0-4) May be repeated for credit; cumulative maximum 8 hours. By audition only. Graduate-level counterpart of Mus 428; additional requirements. Credit not granted for both Mus 428 and 528.

531 Concert Choir 1 (0-4) May be repeated for credit; cumulative maximum 8 hours. By audition only. Graduate-level counterpart of Mus 431; additional requirements. Credit not granted for both Mus 431 and 531.

533 Vocal Ensembles 1 (0-4) May be repeated for credit; cumulative maximum 8 hours. By audition only. Graduate-level counterpart of Mus 433; additional requirements. Credit not granted for both Mus 433 and 533.

534 Symphony Orchestra 1 (0-4) May be repeated for credit; cumulative maximum 8 hours. By audition only. Graduate-level counterpart of Mus 434; additional requirements. Credit not granted for both Mus 434 and 534.

535 Chamber Ensembles 1 (0-4) May be repeated for credit; cumulative maximum 8 hours. By audition only. Graduate-level counterpart of Mus 435; additional requirements. Credit not granted for both Mus 435 and 535.

537 Wind Symphony 1 (0-4) May be repeated for credit; cumulative maximum 8 hours. Graduate-level counterpart of Mus 437; additional requirements. Credit not granted for both Mus 437 and 537.

538 Jazz-Lab Band 1 (0-4) May be repeated for credit; cumulative maximum 8 hours. By audition only. Graduate-level counterpart of Mus 438; additional requirements. Credit not granted for both Mus 438 and 538.

539 Vocal Jazz Ensemble 1 (0-4) May be repeated for credit; cumulative maximum 8 hours. By audition only. Graduate-level counterpart of Mus 439; additional requirements. Credit not granted for both Mus 439 and 539.

540 Jazz Combos 1 (0-4) May be repeated for credit; cumulative maximum 8 hours. By audition only. Graduate-level counterpart of Mus 440; additional requirements. Credit not granted for both Mus 440 and 540.

541 Accompanying 1 (0-4) May be repeated for credit; cumulative maximum 8 hours. Graduate-level counterpart of Mus 441; additional requirements. Credit not granted for both Mus 441 and 541.

550 Seminar in Analysis 2 May be repeated for credit; cumulative maximum 4 hours. Prereq senior or graduate standing. Applications of analytical techniques to develop a basis for musical understanding and interpretation.

553 Seminar in Music Theory 2 May be repeated for credit; cumulative maximum 4 hours. Prereq senior or graduate standing.

556 Graduate Seminar in Advanced Composition V 2 (1-2) to 3 (1-4) May be repeated for credit; cumulative maximum 10 hours. Prereq by interview only. The creation of works for either traditional acoustic ensembles or electro-acoustic media.

559 Seminar in Advanced Jazz Composition V 1-3 May be repeated for credit; cumulative maximum 12 hours. Prereq Mus 457 or permission. Graduate-level counterpart of Mus 459; additional requirements. Credit not granted for both Mus 459 and 559.

560 Introduction to Graduate Studies in Music 2 Prereq senior or graduate standing. Required of all graduate students in music. Basic bibliographic and research techniques; written presentations related to area of emphasis.

561 **Seminar in Literature of 20th Century Music** 2 Prereq senior or graduate standing. Impressionism, expressionism, neoclassicism, neoromanticism, jazz and recent electronic music.

562 **Seminar in Major Ensemble Literature** 2 May be repeated for credit; cumulative maximum 6 hours. Ensemble literature for symphony orchestra, choral or jazz ensembles.

566 **Seminar in Music History** 2 May be repeated for credit; cumulative maximum 6 hours. Prereq senior or graduate standing. Various historic periods and composers.

575 **Advanced Conducting** 2 or 3 May be repeated for credit. Rehearsing orchestras, bands, and choruses. Public performance may be required.

580 **Instrumental Music Education** 3 Graduate counterpart of Mus 480; additional requirements. Credit not granted for both Mus 480 and 580.

586 **Seminar in Piano Pedagogy** 2 Prereq Mus 502 or c//. Materials and methods of teaching experiences.

588 **Choral Methods and Materials I** 2 (0-6) Prereq senior or graduate standing. Graduate-level counterpart of Mus 488; additional requirements. Credit not granted for both 488 and 588.

589 **Choral Methods and Materials II** 2 Prereq Mus 588. Graduate-level counterpart of Mus 489; additional requirements. Credit not granted for both Mus 489 and 589.

590 **General Music/Materials/Methods** 3 Prereq senior or graduate standing. Graduate-level counterpart of Mus 490; additional requirements. Credit not granted for both Mus 490 and 590.

591 **Vocal Pedagogy** 2 (1-2) Prereq graduate standing. Graduate-level counterpart of Mus 491; additional requirements. Credit not granted for both Mus 491 and 591.

596 **Topics in Music** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Permission of the program coordinator. Graduate counterpart of MUS 496; additional requirements. Credit not granted for both MUS 496 and 596.

600 **Special Projects or Independent Study** V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 **Master's Research, Thesis, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 **Master's Special Problems, Directed Study, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

Music

Degree offered: Master of Arts in Music - Non Thesis

Faculty working with graduate students: 26

Graduate students: 15

Graduate students receiving assistantships or scholarships: 80%

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

A graduate recital is required in the performance emphasis, including the conducting emphasis.

Program Description

The School of Music offers the degree Master of Arts in Music, which may be earned through studies in the areas of music education, composition, music history and literature, conducting, and performance studies. Though selection of an emphasis is not required, four emphases are available. The emphasis in music education provides advances studies for experience and prospective teachers. The emphases in performance and composition are selected by students wishing to teach at the college level or intending to enter such professions as music performance, conducting, composing and arranging. Students electing the jazz emphasis focus on one or more aspects of jazz music - performance, composition, arranging, pedagogy, or history for example - in preparation for careers in jazz. The program offers both thesis and non-thesis options, designed according to the goals of the student. Composition emphasis students must complete the thesis option. The Master of Arts in Music degree offered by the Music Program is flexible and provides students the opportunity to develop a unique program of study to satisfy individual interests and goals. The intention of the Music Program and its Graduate Faculty is to provide the best of instruction to our graduate students, maintaining the highest of standards.

Degree Description

The music program in the School of Music offers the degree of Master of Arts in music, which may be earned through study in areas of music education, composition, music history and literature, conducting, and performance studies. Four emphases are available: -Music education--Provides advanced studies for experienced or prospective teachers. -Performance--selected by students wishing to teach at the college level or enter professions such as music performance and conducting. -Composition--prepares students to enter professions in music such as composition and arranging. -Jazz emphasis--focuses on one or more aspects of jazz music - performance, composition, arranging, pedagogy, or history for example - in preparation for careers in jazz. The degree may also be completed without an emphasis. The program offers both thesis and non-thesis options, designed according to the goals of the student. Composition emphasis students must complete the thesis option.

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Contact Information

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MUS

362 **History of Jazz** 3 History of jazz in chronological sequence; social and political contexts of the African-American origins of jazz; stylistic developments.

363 Women in Music 3 Interdisciplinary examination of the way gender intersects with race and class to affect American women in music.

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482 Instrumental Conducting 1 (0-3) Techniques and patterns in conducting as applied to orchestra and band literature; score preparation and rehearsal techniques for instrumental ensembles.

483 Choral Conducting 1 (0-3) Techniques and patterns in conducting as applied to choral literature; score preparation and rehearsal techniques for choral ensembles.

487 String Techniques 2 (0-6) String techniques, materials and methods for music education majors.

493 Wind and Percussion Techniques I 2 (0-6) Brass, woodwind, and percussion techniques for music education majors.

494 Wind and Percussion Techniques II 2 (0-6) Prereq Mus 493. Brass, woodwind and percussion techniques; elementary instrument conducting for music education majors.

498 Piano Pedagogy Practicum 2 May be repeated for credit; cumulative maximum 6 hours. Prereq applied piano study. Piano Pedagogy Practicum 2 Supervised teaching in Piano Preparatory Lab School, including lesson planning and meetings with coordinator for critiques and suggestions.

501 Organ 2(0-6) or 4(0-12)

502 Piano 2(0-6) or 4(0-12) May be repeated for credit.

503 Voice 2(0-6) or 4(0-12) May be repeated for credit. Prereq c// in Mus 431, 432, or by interview only.

504 French Horn 2(0-6) or 4(0-12) May be repeated for credit.

505 Trumpet 2(0-6) or 4(0-12) May be repeated for credit.

506 Trombone 2(0-6) or 4(0-12) May be repeated for credit.

507 Baritone 2(0-6) or 4(0-12) May be repeated for credit.

508 Tuba 2(0-6) or 4(0-12) May be repeated for credit.

509 Percussion 2(0-6) or 4(0-12) May be repeated for credit.

510 Violin 2(0-6) or 4(0-12) May be repeated for credit.

511 Viola 2(0-6) or 4(0-12) May be repeated for credit.

512 Violoncello 2(0-6) or 4(0-12) May be repeated for credit.

513 Contrabass 2(0-6) or 4(0-12) May be repeated for credit.

514 Flute 2(0-6) or 4(0-12) May be repeated for credit.

515 Oboe 2(0-6) or 4(0-12) May be repeated for credit.

516 Clarinet 2(0-6) or 4(0-12) May be repeated for credit.

517 Bassoon 2(0-6) or 4(0-12) May be repeated for credit.

518 Saxophone 2(0-6) or 4(0-12) May be repeated for credit.

519 Secondary Performance Study 1 or 2 May be repeated for credit; cumulative maximum 6 hours. Prereq bachelor's degree in music. Instruction on instruments or voice other than major performing medium.

522 Graduate Recital 2 May be repeated for credit; cumulative maximum 4 hours. Private screening and public performance as required within each performance emphasis.

528 Opera Workshop 1 (0-4) May be repeated for credit; cumulative maximum 8 hours. By audition only. Graduate-level counterpart of Mus 428; additional requirements. Credit not granted for both Mus 428 and 528.

531 Concert Choir 1 (0-4) May be repeated for credit; cumulative maximum 8 hours. By audition only. Graduate-level counterpart of Mus 431; additional requirements. Credit not granted for both Mus 431 and 531.

533 Vocal Ensembles 1 (0-4) May be repeated for credit; cumulative maximum 8 hours. By audition only. Graduate-level counterpart of Mus 433; additional requirements. Credit not granted for both Mus 433 and 533.

534 Symphony Orchestra 1 (0-4) May be repeated for credit; cumulative maximum 8 hours. By audition only. Graduate-level counterpart of Mus 434; additional requirements. Credit not granted for both Mus 434 and 534.

535 Chamber Ensembles 1 (0-4) May be repeated for credit; cumulative maximum 8 hours. By audition only. Graduate-level counterpart of Mus 435; additional requirements. Credit not granted for both Mus 435 and 535.

537 Wind Symphony 1 (0-4) May be repeated for credit; cumulative maximum 8 hours. Graduate-level counterpart of Mus 437; additional requirements. Credit not granted for both Mus 437 and 537.

538 Jazz-Lab Band 1 (0-4) May be repeated for credit; cumulative maximum 8 hours. By audition only. Graduate-level counterpart of Mus 438; additional requirements. Credit not granted for both Mus 438 and 538.

539 Vocal Jazz Ensemble 1 (0-4) May be repeated for credit; cumulative maximum 8 hours. By audition only. Graduate-level counterpart of Mus 439; additional requirements. Credit not granted for both Mus 439 and 539.

540 Jazz Combos 1 (0-4) May be repeated for credit; cumulative maximum 8 hours. By audition only. Graduate-level counterpart of Mus 440; additional requirements. Credit not granted for both Mus 440 and 540.

541 Accompanying 1 (0-4) May be repeated for credit; cumulative maximum 8 hours. Graduate-level counterpart of Mus 441; additional requirements. Credit not granted for both Mus 441 and 541.

550 Seminar in Analysis 2 May be repeated for credit; cumulative maximum 4 hours. Prereq senior or graduate standing. Applications of analytical techniques to develop a basis for musical understanding and interpretation.

553 Seminar in Music Theory 2 May be repeated for credit; cumulative maximum 4 hours. Prereq senior or graduate standing.

556 Graduate Seminar in Advanced Composition V 2 (1-2) to 3 (1-4) May be repeated for credit; cumulative maximum 10 hours. Prereq by interview only. The creation of works for either traditional acoustic ensembles or electro-acoustic media.

559 Seminar in Advanced Jazz Composition V 1-3 May be repeated for credit; cumulative maximum 12 hours. Prereq Mus 457 or permission. Graduate-level counterpart of Mus 459; additional requirements. Credit not granted for both Mus 459 and 559.

560 Introduction to Graduate Studies in Music 2 Prereq senior or graduate standing. Required of all graduate students in music. Basic bibliographic and research techniques; written presentations related to area of emphasis.

561 Seminar in Literature of 20th Century Music 2 Prereq senior or graduate standing. Impressionism, expressionism, neoclassicism, neoromanticism, jazz and recent electronic music.

562 Seminar in Major Ensemble Literature 2 May be repeated for credit; cumulative maximum 6 hours. Ensemble literature for symphony orchestra, choral or jazz ensembles.

566 Seminar in Music History 2 May be repeated for credit; cumulative maximum 6 hours. Prereq senior or graduate standing. Various historic periods and composers.

575 Advanced Conducting 2 or 3 May be repeated for credit. Rehearsing orchestras, bands, and choruses. Public performance may be required.

580 Instrumental Music Education 3 Graduate counterpart of Mus 480; additional requirements. Credit not granted for both Mus 480 and 580.

586 Seminar in Piano Pedagogy 2 Prereq Mus 502 or c//. Materials and methods of teaching experiences.

588 Choral Methods and Materials I 2 (0-6) Prereq senior or graduate standing. Graduate-level counterpart of Mus 488; additional requirements. Credit not granted for both 488 and 588.

589 Choral Methods and Materials II 2 Prereq Mus 588. Graduate-level counterpart of Mus 489; additional requirements. Credit not granted for both Mus 489 and 589.

590 General Music/Materials/Methods 3 Prereq senior or graduate standing. Graduate-level counterpart of Mus 490; additional requirements. Credit not granted for both Mus 490 and 590.

591 Vocal Pedagogy 2 (1-2) Prereq graduate standing. Graduate-level counterpart of Mus 491; additional requirements. Credit not granted for both Mus 491 and 591.

596 Topics in Music V 1-3 May be repeated for credit; cumulative maximum 6 hours. Permission of the program coordinator. Graduate counterpart of MUS 496; additional requirements. Credit not granted for both MUS 496 and 596.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Natural Resource Sciences

Degree offered: Master of Science in Natural Resource Sciences

Faculty working with graduate students: 10

Graduate students: 12

Graduate students receiving assistantships or scholarships: 41%

Requirements

Students are required to take NATRS 594 and NATRS 595, NATRS 700 plus one other grad level seminar in any discipline, including NATRS but not limited to.

Faculty

Keith Blatner, Matthew Carroll, Linda Hardesty, Raymond Jussaume, Barry Moore, Charles Robbins, Rodney Sayler, Lisa Shipley, Mark Swanson and Robert Wielgus.

Natural Resource Sciences

NATRS

594 Environmental and Natural Resources Issues and Ethics 3 Prereq senior standing. Ethical systems applied to natural resources; issues of professionalism and ethics in natural resource management.

595 Seminar in Natural Resource Sciences 1 May be repeated for credit. Literature review; preparation and presentation of reports in natural resource sciences.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Natural Resource Sciences

Degree offered: Master of Science in Natural Resource Sciences - Non Thesis

Requirements

Please see the program/department for more information.

Neuroscience

Degree offered: Doctor of Philosophy (Neuroscience)

Faculty working with graduate students: 43

Graduate students: 28

Graduate students receiving assistantships or scholarships: 100%

Program offered: Pullman, Spokane, Vancouver

Tests required: GRE (Combined), TOEFL

Deadline: Fall: January 10
Spring: July 1

Program Description

Neuroscience, the study of the brain and central nervous system, is a multidisciplinary program leading to the Master of Science and Doctor of Philosophy degree. The neuroscience field plays an important role in both human and animal biomedical science. Innovations by Washington State University neuroscientists advance the world's understanding of how nerves and brain chemicals produce our feelings and behaviors and how poor health results

from disturbances in the delicate organization of the brain. Neuroscience seeks to answer questions that touch on nearly every aspect of human life, including feeling, eating, sleeping, remembering, sensing, and maintaining health.

Degree Description

Neuroscience, the study of the brain and central nervous system, is a multidisciplinary program leading to the Master of Science and Doctor of Philosophy degree. The neuroscience field plays an important role in both human and animal biomedical science. Innovations by Washington State University neuroscientists advance the world's understanding of how nerves and brain chemicals produce our feelings and behaviors and how poor health results from disturbances in the delicate organization of the brain. Neuroscience seeks to answer questions that touch on nearly every aspect of human life, including feeling, eating, sleeping, remembering, sensing, and maintaining health.

Training and Professional Development Opportunities

N/A

Post-Graduate Employment Opportunities

Post Doctoral Fellow at Higher Education Institutions, Industry (e.g. pharmaceutical, biotech)

Post-Graduate Career Placements

Post Doctoral Fellow at Higher Education Institutions, faculty at Higher Education Institutions, Industry (e.g. pharmaceuticals, biotech)

Contact Information

Becky Morton
Manager
VCAPP-Program in Neuroscience
Pullman, WA 99164-6520
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E-mail: bmorton@wsu.edu

Faculty

Bruce Becker, Gregory Belenky, R Brown, Murali Chandra, Rebecca Craft, Krzysztof Czaja, Wenji Dong, Yan Dong, Samantha Gizerian, Joseph Harding, Barbara Ingermann, Susan Ingram-Osborn, Heiko Jansen, Levente Kapas, James Krueger, David Lin, Peter Meighan, Starla Meighan, Stacia Moffett, Michael Morgan, Ruth Newberry, Jaak Panksepp, Christine Portfors, Raymond Quock, David Rector, Robert Ritter, W Ritter, James Schenk, Maureen Schmitter-Edgecombe, Steve Simasko, Leslie Sprunger, Deborah Stenkamp, Eva Szentirmai, Catherine Ulibarri, Hans Van Dongen, Michael Varnum, Anita Vasavada, Brendan Walker, Gary Wayman, Suzanne Wayman, Paul Whitney, Jonathan Wisor and John Wright.

MBIOS

303 **Introductory Biochemistry** 4 Prereq Chem 106; Chem 345. Modern biochemistry for undergraduates in the biological sciences.

503 **Molecular Biology I** 3 Prereq MBioS 301, 303, or graduate standing. DNA replication and recombination in prokaryotes and eukaroytes; recombinant DNA methods and host/vector systems; genome analysis; transgenic organisms.

504 **Molecular Biology II** 3 Prereq MBioS 301, 303, or graduate standing. Gene expression and regulation in prokaryotes and eukaryotes, including transcription, RNA processing, and translation; chromatin structure; DNA repair.

513 **General Biochemistry I** 3 Prereq MBioS 303, graduate standing. Graduate-level counterpart of MBioS 413; additional requirements. Credit not granted for both MBioS 413 and 513.

514 **General Biochemistry** 3 Prereq MBioS 413, or graduate standing. Graduate-level counterpart of MBioS 414; additional requirements. Credit not granted for both 414 and 514.

NEURO

404 **Neuroanatomy** 4 (3-3) Prereq Neuro 301, or by interview only. Fundamental principles of the organization and plans of circuitry of the nervous system.

430 **Principles of Neurophysiology** 4 (3-3) Prereq Biol 107; Neuro 301; Phys 102, 202 or 206; or by interview; Rec MBioS 303. Advanced exploration of the principles underlying cellular, sensory, motor and integrative functions of the nervous system.

509 **Affective Neuroscience** 3 Prereq graduate standing. Graduate-level counterpart of Neuro 409; additional requirements. Credit not granted for both Neuro 409 and 509.

520 **Fundamentals of Neuroscience** 4 (3-3) Prereq permission of instructor or graduate standing. Functional aspects of the brain from cell membrane to higher integrative processes.

521 **Introduction to Veterinary Neurology** 3 (2-3) Prereq V M 510P. Same as V M 521P.

526 **Domestic and Exotic Animal Behavior** 2 (1-3) Prereq by interview only. Same as V M 526P.

531 **Neuroscience Laboratory Rotation** 1 (0-3) May be repeated for credit; cumulative maximum 2 hours. Prereq graduate standing. Fourteen-week rotation through each of two research laboratories; learning procedures and techniques in neuroscience.

540 **Special Topics in Integrative Neuroscience** 3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing. Concepts and controversies in neuroscience involving integrative properties of cell systems. May be repeated for credit; cumulative maximum 6 hours.

541 **Special Topics in Cellular and Molecular Neuroscience** 3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing. Concepts and controversies in neuroscience that involve nerve cell function and regulation. May be repeated; cumulative maximum 6 hours.

542 **Special Topics in Disciplinary Neuroscience** 3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing. Concepts and controversies in neuroscience that revolve around traditional approaches to nervous system study. May be repeated; cumulative maximum 6 hours.

543 **Special Topics in Behavioral/Clinical Neuroscience** 3 May be repeated for credit; cumulative maximum 6 hours. Concepts and controversies in neuroscience that involve normal and pathological aspects of behavior.

590 **Seminar** 1 May be repeated for credit; cumulative maximum 4 hours. Presented by advanced graduate students and faculty (both in VCAPP and around WSU) on their research areas.

592 **Research Writing and Seminar** 3 May be repeated for credit; cumulative maximum 6 hours. Written and oral communication of scientific information; formal instruction while preparing research proposals and departmental seminar.

600 **Special Projects or Independent Study** V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 **Master's Research, Thesis, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 **Doctoral Research, Dissertation, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

PHARS

505 Principles and Methods of Toxicology 3 Prereq MBioS 513 or c//; 300-level organ/mammalian physiology or permission of instructor. Basic concepts in mammalian toxicology and the methodology currently employed for toxicological investigations.

506 Principles of Pharmacology 3 Prereq MBioS 513 or c//. Mechanisms of drug action and the factors that modify drug responses; drug design and drug development.

507 Principles of Therapeutics 3 Prereq 300-level organ/mammalian physiology; P/T 506. Organ systems pharmacology, including drug actions, effects, side effects, and interaction of medications used in therapeutics.

PHIL

530 Bioethics 2 Prereq graduate standing. Professional ethics for scientists; ethical implications of new technologies; obligations to human and non-human research subjects.

PSYCH

575 Foundations of Neuropsychology 3 Foundations in brain/behavior relationships and neuropathological syndromes; preparation for advanced training in neuropsychological assessment.

577 Behavioral Pharmacology 3 Prereq Psych 574 or graduate standing in Neuro or P/T. Survey of drugs which affect brain function with emphasis on animal models and clinical applications.

584 Sensory Bases of Behavior 3 Sensory and physiological aspects of vision, audition, and other senses.

STAT

412 Statistical Methods in Research I 3 Prereq Stat 212, Math 140, 171, 202, or graduate standing. Intermediate statistical methods, design and analysis of research studies: completely randomized and randomized block designs, multiple regression, categorical data analysis.

507 Experimental Design 3 Prereq Stat 512. Methods of constructing and analyzing designs for experimental investigations; analysis of designs with unequal subclass numbers; concepts of blocking randomization and replication; confounding in factorial experiments; incomplete block designs; response surface methodology.

512 Statistical Methods in Research II 3 (2-2) Prereq Stat 412 or equivalent. Analysis and interpretation of designed experiments: CRD, RCBD, spit-plot and repeated measures, multiple comparisons, multiple regression modeling, validation of assumptions.

UNIV

590 Preparation for College Teaching 2 Prereq graduate standing/TA appointment. Cross-discipline instructional development for graduate teaching assistants; course development teaching techniques, university policies and procedures.

597 Preparing the Future Professoriate 2 Prereq doctoral student standing. Understanding and contextual knowledge of the professoriate and issues facing higher education.

V PH

555 General and Cellular Physiology 4 (3-3) Prereq MBioS 303 or c//; MBioS 513. Physiochemical mechanisms of cellular function.

Neuroscience

Degree offered: Master of Science in Neuroscience

Faculty working with graduate students: 44

Graduate students: 2

Graduate students receiving assistantships or scholarships: 100%

Program offered: Pullman, Spokane, Vancouver

Tests required: GRE (Combined), TOEFL

Deadline: Fall: January 10
Spring: July 1

Program Description

Neuroscience, the study of the brain and central nervous system, is a multidisciplinary program leading to the Master of Science and Doctor of Philosophy degree. The neuroscience field plays an important role in both human and animal biomedical science. Innovations by Washington State University neuroscientists advance the world's understanding of how nerves and brain chemicals produce our feelings and behaviors and how poor health results from disturbances in the delicate organization of the brain. Neuroscience seeks to answer questions that touch on nearly every aspect of human life, including feeling, eating, sleeping, remembering, sensing, and maintaining health.

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Training and Professional Development Opportunities

n/a

Post-Graduate Employment Opportunities

Continue to PhD degree, Industry (e.g. pharmaceutical, biotech)

Post-Graduate Career Placements

Continue to PhD degree, Industry (e.g. pharmaceutical, biotech)

Contact Information

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UNIV

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597 **Preparing the Future Professoriate** 2 Prereq doctoral student standing. Understanding and contextual knowledge of the professoriate and issues facing higher education.

V PH

555 **General and Cellular Physiology** 4 (3-3) Prereq MBioS 303 or c//; MBioS 513. Physiochemical mechanisms of cellular function.

Nuclear Engineering - Cert in Nuclear Eng

Degree offered: Graduate Certificate in Nuclear Engineering

Faculty working with graduate students: 30

Graduate students: 5

Program offered: Pullman, Tri-Cities

Deadline: Fall: January 10
Spring: July 1

Requirements

Students must complete a minimum of 9 credits (of which 6 credits must be at the 500-level) from the following list of 3-credit courses: ME 461 Intro to Nuclear Engineering, ME 483 Topics in ME: Nuclear Safeguards and Security, ME 565 Nuclear Reactor Engineering, ME 579 Advanced Topics in ME: Nuclear Reactor Engineering, Chem 550 Special Topics: Nuclear Processes and Radioactive Waste Management. Note: courses in which a grade of B- or below is obtained may not count towards completion of the requirements.

Program Description

Our nation is in the early stages of a nuclear energy renaissance. Nuclear energy shows promise as a carbon free energy source to address growing energy demands. This certificate program will benefit students who wish to pursue employment opportunities in the nuclear industry. The program provides formal academic coursework to engineers whose training is in a non-nuclear discipline or graduate students who wish to have an emphasis in this area. Studies show that only a small portion of engineers employed in the nuclear industry (approximately five percent) have a nuclear engineering degree. Thus, this approach supplies the needs and expectations of the current and future industry.

Degree Description

This certificate program provides formal academic coursework to engineers whose training is in a non-nuclear discipline or graduate students who wish to have an emphasis in this area. Students must complete a minimum of nine credits (of which six credits must be at the 500-level) from a specific list of courses found at http://www.mme.wsu.edu/grad/certificate.html.

Training and Professional Development Opportunities

None.

Post-Graduate Employment Opportunities

This certificate program will benefit students who wish to pursue employment opportunities in the nuclear industry.

Contact Information

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Faculty

Gaurav Ameta, Stephen Antolovich, David Bahr, Amit Bandyopadhyay, Susmita Bose, Jow-Lian Ding, Indranath Dutta, Prashanta Dutta, Karl Englund, David Field, Sankar Jayaram, Uma Jayaram, William Kinsel, Jacob Leachman, David Lin, Kelvin Lynn, Konstantin Matveev, Sinisa Mesarovic, Changki Mo, M Norton, Jitesh Panchal, Charles Pezeshki, Cecilia Richards, Robert Richards, Lloyd Smith, Anita Vasavada, Michael Wolcott, Hussein Zbib, Jinwen Zhang and Weihong Zhong.

CHEM

550 **Special Topics in Nuclear Processes and Radioactive Waste Management** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq permission of instructor. Fundamental chemistry of the nuclear industry, chemical processing and waste management.

Mechanical Engineering

M E

461 **Introduction to Nuclear Engineering** 3 Prereq junior or senior standing in engineering or physical sciences; Math 315 or equivalent. Applied nuclear physics; application to the nuclear fuel cycle and nuclear reactor core design; nuclear reactor systems and safety.

483 **Topics in Mechanical Engineering** V 1 (0-4) to 4 (0-12) May be repeated for credit; cumulative maximum 7 hours. Contemporary topics in materials engineering.

579 **Advanced Topics in Mechanical Engineering** V 1-3 May be repeated for credit.

Nurse Educator - Cert in Nurse Educator

Degree offered: Graduate Certificate in Nurse Educator

Faculty working with graduate students: 20

Graduate students: 10

Program offered: Spokane, Tri-Cities, Vancouver

Tests required: TOEFL, TOEFLI

Deadline: Fall: February 1
Spring: October 1

Requirements

- a bachelor's degree - admitteded in the MN degree program- a minimum 3.00 grade point average in undergraduate work (exceptions may be made based on substantial evidence of extra-scholastic qualifications) - successful completion of a basic statistics course - favorable recommendations regarding practice and potential for graduate work in nursing - RN license to practice nursing in Washington - written goal statement congruent with program's philosophy and focus - complete a written interview

Program Description

The masters program in nursing at the College of Nursing is accredited by the Commission on Collegiate Nursing Education. The program builds upon an under-

graduate degree in nursing and provides a basis for further study at the doctoral level. The purpose is to prepare students for leadership positions in advanced nursing practice.

Degree Description

The nurse educator certificate program, a track within the Advanced Practice for Population Health (APH) graduate nursing program, includes the completion of four theory courses that focus on teaching and learning, with an emphasis on distance friendly educational pedagogy. The program also is open to post-masters students wishing to focus on nursing education. Each course is designed to be primarily web based with some videoconferencing class sessions. Additional practicum experiences can be arranged; the NURS 556 capstone practicum (a requirement for all APH students) also offers opportunities for an educational focus. A certificate will be awarded upon completion of all requirements for the MN degree/education track.

Training and Professional Development Opportunities

None

Post-Graduate Employment Opportunities

Nurse educator

Post-Graduate Career Placements

Teaching positions in colleges of nursing

Contact Information

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Phyllis Eide
Associate Professor
WSU College of Nursing
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E-mail: eide@wsu.edu

Faculty

Carol Allen, Mary Bayne, Sandra Benavides-Vaello, Ruth Bindler, Debra Brinker, Patricia Butterfield, Joan Caley, Cynthia Corbett, Dawn Doutrich, Alice Dupler, Linda Eddy, Phyllis Eide, Renee Hoeksel, Janet Katz, Janet Lohan, Julie Postma, Denise Smart, Janet Spuck, Catherine Van Son and Roxanne Vandermause.

NURS

519 Teaching in the Information Age 3 Prereq basic computer skills; permission of instructor. Focus on educational paradigms consistent with distance education; development of a variety of multimedia materials for nursing education.

520 Nursing Education in a Multicultural Society V 3 (0-9) to 5 (0-15) Prereq permission of instructor. Application of learning theories and strategies useful in teaching diverse populations; taught in a distance degree format.

521 Teaching, Learning and Evaluation in Nursing V 3 (3-0) to 6 (3-9) Prereq graduate standing in Nurs or by permission. Exploration of concepts related to teaching-learning, assessment of diverse learning needs, instructional strategies and design, evaluation of performance outcomes.

523 Educational Issues and Curriculum Analysis V 3 (3-0) to 5 (3-6) Prereq graduate standing in nursing or by permission. Exploration of curriculum history, development, future predictions; program evaluation, instructional resources, leadership, and policy development in academic and service settings.

556 Community-Based/Population-Focused Role Practicum V 2 (1-3) to 6 (2-12) Prereq permission of instructor. Culminating analysis, development, and enactment of advanced practice roles in teaching, practice, or administration of community-based/population-focused nursing.

Nursing - Community-Based/Population Focused Care

Degree offered: Master of Nursing (Community-Based/Population Focused Care)

Faculty working with graduate students: 59

Graduate students: 56

Graduate students receiving assistantships or scholarships: 12%

Program offered: Spokane, Tri-Cities, Vancouver

Tests required: TOEFL, TOEFLI

Deadline: Fall: February 1
Spring: October 1

Program Description

The masters program in nursing at the College of Nursing is accredited by the Commission on Collegiate Nursing Education. The program builds upon an undergraduate degree in nursing and provides a basis for further study at the doctoral level. The purpose is to prepare students for leadership positions in advanced nursing practice.

Degree Description

This graduate program is designed to meet the needs of nurses who practice, teach or administer programs in community-based settings. The curriculum offers the following options to meet the needs of nurses providing leadership in a variety of settings: Administration, Education, and Individualized Study.

Post-Graduate Employment Opportunities

Community nurse educators and administrators.

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NURS

503 Scientific Inquiry in Nursing 2 Prereq graduate standing in nursing or permission of the instructor. Scientific inquiry applied to theoretical and philosophical foundations in nursing.

504 Methods of Nursing Research 3 Prereq Nurs 503 or c//. Research process as foundational to both conduct of scientific inquiry and utilization of findings.

507 Health Care Policy Analysis V 2-3 Prereq graduate standing. Analysis of health care system policy; exploration of issues of clinical management and community resource utilization including advocacy techniques.

519 Teaching in the Information Age 3 Prereq basic computer skills; permission of instructor. Focus on educational paradigms consistent with distance education; development of a variety of multimedia materials for nursing education.

520 Nursing Education in a Multicultural Society V 3 (0-9) to 5 (0-15) Prereq permission of instructor. Application of learning theories and strategies useful in teaching diverse populations; taught in a distance degree format.

521 Teaching, Learning and Evaluation in Nursing V 3 (3-0) to 6 (3-9) Prereq graduate standing in Nurs or by permission. Exploration of concepts related to teaching-learning, assessment of diverse learning needs, instructional strategies and design, evaluation of performance outcomes.

523 Educational Issues and Curriculum Analysis V 3 (3-0) to 5 (3-6) Prereq graduate standing in nursing or by permission. Exploration of curriculum history, development, future predictions; program evaluation, instructional resources, leadership, and policy development in academic and service settings.

532 Resource Stewardship in Health Care 3 Prereq graduate standing in nursing. Theory, research and practice dimensions of resource stewardship to effectively manage human and material resources in the practice setting.

550 International, Interdisciplinary, and Transcultural Health Care 3 Prereq graduate standing in nursing or by permission. Diverse health beliefs and practices or clients and members of the interdisciplinary health care team.

551 Risk and Resilience in Child and Adolescent Health 4 Prereq graduate standing in nursing. Risk and resilience models in the development of strengths-based health interventions for child and adolescent populations.

552 Family Nursing in the Community V 2 (2-0) to 4 (2-4) Theoretical approaches to the analysis of normal and at-risk families; application of family assessment and intervention models when planning care.

554 Epidemiological Approaches to Community Health 3 Prereq graduate standing in Nurs. Epidemiologic application to health; implications for health promotion, disease prevention; focus: knowledge and skills required to obtain and use databases.

556 Community-Based/Population-Focused Role Practicum V 2 (1-3) to 6 (2-12) Prereq permission of instructor. Culminating analysis, development, and enactment of advanced practice roles in teaching, practice, or administration of community-based/population-focused nursing.

564 Health Promotion in Nursing Practice V 2-3 Prereq graduate standing in nursing. Theoretical bases including cultural variations for selected health promotion strategies for neonates through elderly clients.

565 Information Management for Clinical Practice 3 (2-3) Prereq computer competency in word processing/spreadsheets. Application/evaluation of nursing informatics; information systems to support clinical research, practice, administration, and education.

566 Community Analysis and and Grant Development 2 Prereq graduate standing in nursing. Application of core public health functions in community analysis, program development and program evaluation.

576 Organizational Leadership 3 Prereq graduate standing in nursing. Integration of leadership competencies and nursing practice for nurse leaders in a constantly changing health care environment.

591 Mixed Methods for Outcome Evaluation 2 Prereq graduate standing in nursing. Outcomes and evaluation in nursing and health care from both a qualitative and quantitative methods and application perspective.

597 Advanced Topics in Nursing V 1-3 May be repeated for credit; cumulative maximum 6 hours.

598 Advanced Topics in Nursing V 1-3 May be repeated for credit; cumulative maximum 6 hours. May be repeated for credit; cumulative maximum 6 hours.

599 Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1-18 May be repeated for credit.

Nursing - Family Nurse Practitioner

Degree offered: Master of Nursing (Family Nurse Practitioner)

Faculty working with graduate students: 60

Graduate students: 153

Graduate students receiving assistantships or scholarships: 32%

Program offered: Spokane, Tri-Cities, Vancouver

Tests required: TOEFL, TOEFLI

Deadline: Fall: February 1
Spring: October 1

Program Description

The masters program in nursing at the College of Nursing is accredited by the Commission on Collegiate Nursing Education. The program builds upon an undergraduate degree in nursing and provides a basis for further study at the doctoral level. The purpose is to prepare students for leadership positions in advanced nursing practice.

Degree Description

The MN degree program prepares advanced-practice nurses with leadership skills to plan, implement, coordinate and evaluate health care, as well as formulate policy for a diverse and multi-cultural society. It also prepares advanced-practice nurses to work with health care providers and those in other occupations to plan and provide high quality care. A post-masters program is also available for nurse practitioner students.

Post-Graduate Employment Opportunities

Family Nurse Practitioner positions

Post-Graduate Career Placements

FNP positions such as clinics, offices, hospitals, in rural and urban areas.

Contact Information

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NURS

503 Scientific Inquiry in Nursing 2 Prereq graduate standing in nursing or permission of the instructor. Scientific inquiry applied to theoretical and philosophical foundations in nursing.

504 Methods of Nursing Research 3 Prereq Nurs 503 or c//. Research process as foundational to both conduct of scientific inquiry and utilization of findings.

507 Health Care Policy Analysis V 2-3 Prereq graduate standing. Analysis of health care system policy; exploration of issues of clinical management and community resource utilization including advocacy techniques.

562 Advanced Health Assessment and Differential Diagnoses 4 (3-3) Prereq graduate standing in nursing. Advanced holistic health assessment/differential diagnosis; analysis of data from biological, sociological, psychological, cultural, and spiritual dimensions.

563 Advanced Pharmacological Concepts and Practice 4 (3-3) Prereq graduate standing in nursing. Pharmacology for clinical practice including decision making, prescribing, drug monitoring, and patient education associated with prescriptive authority.

567 Primary Care of Families: Adults and Elders 4 (1-9) Prereq admission to FNP program; Nurs 562; Nurs 563; Nurs 581. Assessment, differential diagnosis, therapeutic intervention with adults; developmental changes; opportunities to provide diagnostic, maintenance, and follow-up care.

568 Primary Care of Families: Infants, Children and Adolescents 4 (1-9) Prereq admission to FNP program; Nurs 562; Nurs 563; Nurs 581. Assessment, differential diagnosis, and therapeutic intervention with infants, children, and adolescents in rural and urban settings.

569 Primary Care of Families: Family 4 (1-9) Prereq admission to FNP program; Nurs 562; Nurs 563; Nurs 581. Assessment, differential diagnosis, therapeutic intervention with individuals in childbearing, childrearing, and multigenerational families.

570 Clinical Decision Making 1 (0-3) Prereq Nurs 581, 562, 563; concurrent with first clinical course. Provides a framework for systematic collection, organization, interpretation, and communication of data for the development of differential diagnosis.

575 Diagnostic Testing and Interpretation 3 (2-3) Prereq admission to FNP program. Analysis of diagnostic findings across the age continuum for clinical decision making; selected diagnostic and treatment skills for advanced practice.

581 Advanced Pathophysiology 4 Prereq graduate standing in nursing or permission of instructor. Advanced cellular and system pathophysiology of individuals with neurological, endocrine, immune, hematolgoy, cardiopulmonary, renal, gastrointestinal, bone and skin disorders.

595 Internship V 1 (0-3) to 10 (0-30) May be repeated for credit; cumulative maximum 10 hours. Prereq admission to FNP program; Nurs 562; Nurs 563; Nurs 581; one of Nurs 567, 568, 569, 571, or 572. Application and integration of theoretical content, research findings, and assessment and intervention strategies into primary care practice.

598 Advanced Topics in Nursing V 1-3 May be repeated for credit; cumulative maximum 6 hours. May be repeated for credit; cumulative maximum 6 hours.

599 Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1-18 May be repeated for credit.

Nursing

Degree offered: Doctor of Philosophy (Nursing)

Faculty working with graduate students: 43

Graduate students: 28

Graduate students receiving assistantships or scholarships: 28%

Program offered: Spokane, Vancouver

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Program Description

The masters program in nursing at the College of Nursing is accredited by the Commission on Collegiate Nursing Education. The program builds upon an undergraduate degree in nursing and provides a basis for further study at the doctoral level. The purpose is to prepare students for leadership positions in advanced nursing practice.

Degree Description

The Doctor of Philosophy in Nursing (PhD) prepares you to advance the discipline of nursing science through a research-focused program emphasizing innovative approaches and leveraged resources to improve helath care for all. Graduates of the program are equipped to become leaders in nursing education and research, critical roles in today's health care environment.

Post-Graduate Employment Opportunities

tenure faculty, researchers, and health care administration

Post-Graduate Career Placements

Colleges and schools of Nursing, Education and Research departments of hospitals and other health care environments, state and local government departments related to health care

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NURS

521 Teaching, Learning and Evaluation in Nursing V 3 (3-0) to 6 (3-9) Prereq graduate standing in Nurs or by permission. Exploration of concepts related to teaching-learning, assessment of diverse learning needs, instructional strategies and design, evaluation of performance outcomes.

523 Educational Issues and Curriculum Analysis V 3 (3-0) to 5 (3-6) Prereq graduate standing in nursing or by permission. Exploration of curriculum history, development, future predictions; program evaluation, instructional resources, leadership, and policy development in academic and service settings.

527 Association, Group Difference and Regression Techniques for Health Services 3 Prereq graduate statistics course; graduate standing in nursing. Application of quantitative techniques to explore relationships and group differences among variables supporting questions in health science research.

528 Multivariate Statistical Techniques for Health Sciences 3 Prereq Nurs 527; graduate standing in nursing. Application of quantitative techniques to explore multivariate relationships among variables supporting questions in health science research.

534 Research Seminar: Grant Development 1 Prereq graduate standing. Seminar focusing on grant writing and advanced skills for critically reviewing grant applications.

535 Philosophy of Nursing Science 2 Prereq Nurs 534; 535 or c//. Structure and organization of fields of knowledge in science including historical and philosophical tenets of inquiry.

536 Nursing Theory: Foundations for Knowledge Development 2 Prereq graduate standing in nursing. Theory development analysis; theory critique; nursing knowledge examination; impact of theory on nursing science, applied to studentâ™s phenomenon of interest.

565 Information Management for Clinical Practice 3 (2-3) Prereq computer competency in word processing/spreadsheets. Application/evaluation of nursing informatics; information systems to support clinical research, practice, administration, and education.

572 Nursing Science: Chronic Biobehavioral Nursing Outcomes 3 Prereq admission to graduate program. Concepts, theories and research relevant to preventing and managing chronic conditions across the lifespan.

574 Nursing Sciences: Acute Biobehavioral Nursing Outcomes 2 Prereq Nurs 536. Research methods, procedures and analysis of acute phenomena in nursing with a focus on vulnerable populations.

584 Nursing Science: Systems of Heath Care Delivery 3 Prereq Nurs 536. Health care delivery systems in the US and worldwide addressing barriers to care, social justice, vulnerability and access disparity.

585 Faculty Role Seminar 1 Prereq completion of coursework; completion of preliminary examination or c//. Analysis of current issues related to the faculty role in nursing education.

586 Faculty Role Practicum 2 Prereq admission to graduate program or by permission. Analysis, development and enactment of sleeted aspects of the faculty role.

587 Research Inquiry: Qualitative Methods I 3 Prereq graduate standing in nursing. Qualitative methodologies, issues and techniques of data collection, analysis and interpretation; issues of ethics and bias.

588 Research Inquiry: Quantitative Methods I 3 Prereq graduate standing in nursing. Quantitative methodologies, issues and techniques of data collection, analysis and interpretation.

589 Psychometrics in Health Care Research 2 Prereq Nurs 588; 6 credits of graduate statistics. Application of psychometric theory and techniques for constructing, analyzing and testing instruments to measure nursing and educational interventions and outcomes.

591 Mixed Methods for Outcome Evaluation 2 Prereq graduate standing in nursing. Outcomes and evaluation in nursing and health care from both a qualitative and quantitative methods and application perspective.

593 Preliminary Examination Seminar 1 Prereq completion of 30 core credits in PhD program. Methods to synthesize material from coursework to present and anylyze scholary nursing science knowledge.

799 Dissertation Seminar 1 May be repeated for credit. Prereq graduate student in nursing. Best practices for doctoral research and presentation.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Nursing

Degree offered: Master of Nursing

Program offered: Spokane

Program Description

The masters program in nursing at the College of Nursing is accredited by the Commission on Collegiate Nursing Education. The program builds upon an undergraduate degree in nursing and provides a basis for further study at the doctoral level. The purpose is to prepare students for leadership positions in advanced nursing practice.

Degree Description

The hybrid program uses a combination of online and in-person education to be accessible to students in the region, nation, and from other countries.The curriculum is delivered in two summer semesters--summer admission only--on the Spokane campus, clustered on two days/week, and two fall and spring semesters with a combination of online, in classroom, and distance delivery of classes.

Nursing - Psychiatric/Mental Health Nurse Practitioner

Degree offered: Master of Nursing (Psychiatric/Mental Health Nurse Practitioner)

Faculty working with graduate students: 60

Graduate students: 33

Graduate students receiving assistantships or scholarships: 12%

Program offered: Spokane, Tri-Cities, Vancouver

Tests required: TOEFL, TOEFLI

Deadline: Fall: February 1
Spring: October 1

Program Description

The masters program in nursing at the College of Nursing is accredited by the Commission on Collegiate Nursing Education. The program builds upon an undergraduate degree in nursing and provides a basis for further study at the doctoral level. The purpose is to prepare students for leadership positions in advanced nursing practice.

Degree Description

The MN degree program prepares advanced-practice nurses with leadership skills to plan, implement, coordinate and evaluate health care, as well as formulate policy for a diverse and multi-cultural society. It also prepares advanced-practice nurses to work with health care providers and those in other occupations to plan and provide high quality care.A post-masters certificate also is available for nurse practitioner students.Characteristics of Psychiatric/Mental Health Nurse Practitioner Master of Nursing Graduates: Demonstrate competence in application of theoretical approaches in selected contexts and multiple roles; Utilize theory and principles of psychodynamics and neurobiology in the assessment and promotion of individual, group, family and community health; evaluate, diagnose, intervene and monitor neuropsychiatric problems; and practice within the scope of legal, professional and ethical standards of advanced practice as a psychiatric/mental health nurse practitioner.

Post-Graduate Employment Opportunities

Psych/Mental Health Nurse Practitioner positions

Post-Graduate Career Placements

PMHNP positions in clinics, offices, hospitals, correctional facilities in rural and urban areas.

Contact Information

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NURS

503 Scientific Inquiry in Nursing 2 Prereq graduate standing in nursing or permission of the instructor. Scientific inquiry applied to theoretical and philosophical foundations in nursing.

504 Methods of Nursing Research 3 Prereq Nurs 503 or c//. Research process as foundational to both conduct of scientific inquiry and utilization of findings.

507 Health Care Policy Analysis V 2-3 Prereq graduate standing. Analysis of health care system policy; exploration of issues of clinical management and community resource utilization including advocacy techniques.

525 Psychopharmacology 3 Prereq graduate standing in nursing. Clinical psychopharmacology across the lifespan including pharmacokinetics, pharmacodynamics, principles of prescribing, client education and outcome monitoring.

541 Advanced Family Psychiatric/Mental Health Practitioner: Child, Adult, and Geriatric Therapies 4 (3-3) Prereq graduate standing in nursing; Nurs 562; 581 or c//. Advanced study of theories of psychopathology and appropriate nursing interventions with individuals across the lifespan. Practicum emphasis: assessment, diagnosis, counseling.

543 Advanced Family Psychiatric Mental Health Nurse Practitioner: Group Psychotherapy Across the Livespan 4 (3-3) Prereq Nurs 541; Nurs 581. Introduction to theory and practice of group and family psychotherapy through the life span; Milieu, Cognitive Behavioral, Interpersonal, other theories.

546 Practicum in Psychiatric/Mental Health Nursing V 4 (1-9) to 5 (1-12) Prereq Nurs 541, 543, 562, 581; PharP 525 or c//. Individualized clinical experience/seminar designed to provide advanced competency, accountability, leadership in psychiatric/mental health nursing.

548 Psychiatric Nurse Practitioner Internship V 1-9 May be repeated for credit; cumulative maximum 9 hours. Prereq Nurs 546, PharP525, by interview only. Application and integration of theory, research findings, and interventions in the primary care of clients with psychiatric disorders.

549 Advanced Family Psychiatric Mental Health Nurse Practitioner: Group Psychotherapy Across the Livespan 2 Prereq Graduate standing in nursing or permission of instructor. Overview of the theories, physiology, course and epidemiology of addictions; assessment, evaluation, prevention and treatment.

561 Advanced Family Psychiatric Mental Health Nurse Practitioner: Advanced Assessment and Diagnosis 3 Prereq Admission to PMHNP program. Assessment and diagnosis of psychiatric illnesses; focus on physical and psychiatric history, mental status exam and strategies of psychometric evaluation.

562 Advanced Health Assessment and Differential Diagnoses 4 (3-3) Prereq graduate standing in nursing. Advanced holistic health assessment/differential diagnosis; analysis of data from biological, sociological, psychological, cultural, and spiritual dimensions.

581 Advanced Pathophysiology 4 Prereq graduate standing in nursing or permission of instructor. Advanced cellular and system pathophysiology of individuals with neurological, endocrine, immune, hematolgoy, cardiopulmonary, renal, gastrointestinal, bone and skin disorders.

598 Advanced Topics in Nursing V 1-3 May be repeated for credit; cumulative maximum 6 hours. May be repeated for credit; cumulative maximum 6 hours.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1-18 May be repeated for credit.

Nursing Leadership - Cert in Nursing Leadership

Degree offered: Graduate Certificate in Nursing Leadership

Faculty working with graduate students: 1

Graduate students: 5

Program offered: Spokane, Tri-Cities, Vancouver

Tests required: TOEFL, TOEFLI

Deadline: Fall: February 1
Spring: October 1

Program Description

The masters program in nursing at the College of Nursing is accredited by the Commission on Collegiate Nursing Education. The program builds upon an undergraduate degree in nursing and provides a basis for further study at the doctoral level. The purpose is to prepare students for leadership positions in advanced nursing practice.

Degree Description

This certificate program has been designed for nurse administrators who are seeking advanced education in organizational leadership, quality management/care management, professional practice environments, organizational systems management and communications/collaboration. For certificate program completion, each student must successfully complete the following three credit hour theory courses: NURS 532, Resource Stewardship; NURS 565, Information Management for Clinical Practice; NURS 576, Organizational Leadership, and NURS 591, Quality Improvement/Outcomes and Program Evaluation. These courses explore key concepts relevant to today's healthcare marketplace and are presented from the perspective of multiple clinical practice settings, including acute care institutions, clinic and outpatient settings, public health environments, and community health settings. Students who complete these 12 hours of graduate level educational courses may be eligible to sit for the American Nurses Credentialing Center's Nurse Executive, Advanced certification, pending attainment of all eligibility criteria. Courses are taught in a hybrid mix of face-to-face and web-based delivery. Through web-based technology, educational software, streaming video, communication tools and electronic email, this program is accessible to potential and current nurse executives and other interested nurses in their home communities.

Training and Professional Development Opportunities

None

Post-Graduate Employment Opportunities

Leadership positions in agencies, hospitals, and clinics.

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Faculty

Carol Allen.

NURS

532 Resource Stewardship in Health Care 3 Prereq graduate standing in nursing. Theory, research and practice dimensions of resource stewardship to effectively manage human and material resources in the practice setting.

565 Information Management for Clinical Practice 3 (2-3) Prereq computer competency in word processing/spreadsheets. Application/evaluation of nursing informatics; information systems to support clinical research, practice, administration, and education.

576 Organizational Leadership 3 Prereq graduate standing in nursing. Integration of leadership competencies and nursing practice for nurse leaders in a constantly changing health care environment.

591 Mixed Methods for Outcome Evaluation 2 Prereq graduate standing in nursing. Outcomes and evaluation in nursing and health care from both a qualitative and quantitative methods and application perspective.

Nutrition

Degree offered: Doctor of Philosophy (Nutrition)

Faculty working with graduate students: 30

Graduate students: 3

Graduate students receiving assistantships or scholarships: 100%

Tests required: GRE (Combined)

Deadline: Fall: February 1

Degree Description

The Ph.D. NEP -- with its dual emphasis on nutrition and exercise -- is unique among doctorate programs in the Northwest. Students in the program may pursue research interests in either nutrition or exercise or both, and they can do so from a molecular/cellular, clinical and/or behavioral approach.

Contact Information

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MBIOS

513 General Biochemistry I 3 Prereq MBioS 303, graduate standing. Graduate-level counterpart of MBioS 413; additional requirements. Credit not granted for both MBioS 413 and 513.

Nutrition And Exercise Physiology

NEP

505 Graduate Seminar V 2-3 May be repeated for credit; cumulative maximum 6 hours. Current issues and evaluation of literature related to nutrition, dietetics, exercise physiology practice and research.

510 Foundations of Cellular Regulation 3 Prereq Biol 251, Chem 345, MBioS 303. Fundamentals of pharmacology and toxicology; signal transduction; cellular effects of diet and exercise; action and regulation of dietary supplements.

520 Research Methods in Nutrition and Exercise Physiology 4 Current research designs and methods in nutrition and exercise physiology including behavioral and basic sciences emphasizing chronic disease prevention.

526 Advanced Community Nutrition and Health 3 Prereq Stat 412 or c//; NEP 476 or c//. Research basis of practice in community nutrition or health programs; assessment and outcome measures emphasizing chronic disease prevention.

580 Advanced Topics in Exercise Physiology 3 Prereq NEP 463. Advanced topics in cellular and molecular physiology.

585 Clinical Exercise Physiology 4 Prereq NEP 490. Exercise and nutrition assessment/prescription and program management in rehabilitation for populations in various disease states.

Nutrition And Exercise Physiology

NURS

521 Teaching, Learning and Evaluation in Nursing V 3 (3-0) to 6 (3-9) Prereq graduate standing in Nurs or by permission. Exploration of concepts related to teaching-learning, assessment of diverse learning needs, instructional strategies and design, evaluation of performance outcomes.

589 Psychometrics in Health Care Research 2 Prereq Nurs 588; 6 credits of graduate statistics. Application of psychometric theory and techniques for constructing, analyzing and testing instruments to measure nursing and educational interventions and outcomes.

Nutrition And Exercise Physiology

PHARS

512 Topics in Pharmacology V 1-4 May be repeated for credit; cumulative maximum 12 hours. Prereq by interview only. Topics of current interest in pharmacology and closely related disciplines.

Pharmaceutical Sciences

Degree offered: Doctor of Philosophy (Pharmaceutical Sciences)

Faculty working with graduate students: 30

Graduate students: 13

Graduate students receiving assistantships or scholarships: 92%

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal), TOEFLI

Deadline: Fall: January 15

Program Description

Pharmaceutical Sciences Graduate Program offers a Ph.D. and prepares students for careers in teaching, research and public service. Potential employers of program graduates include colleges and universities, chemical manufacturers, the biotechnology and pharmaceutical industries, federal and private research institutes, and governmental regulatory agencies

Degree Description

Pharmaceutical Sciences Graduate Program offers a Ph.D. and prepares students for careers in teaching, research and public service. Potential employers of program graduates include colleges and universities, chemical manufacturers, the biotechnology and pharmaceutical industries, federal and private research institutes, and governmental regulatory agencies.

Contact Information

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Pharmaceutical Sciences
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Faculty

Melissa Ahern, Miriam Ballejos, Janet Beary, Sally Blank, Marnie Clay, Lawrence Cohen, Sayed Daoud, William Fassett, Laura Frank, Emily Johnson, Judy Knuth, David Koh, Susan Kynast-Gales, Susan Marsh, Gary Meadows, Kathryn Meier, Joshua Neumiller, Gary Pollack, Gregory Poon, Raymond Quock, David Sclar, Stephen Setter, Jill Shultz, Sergei Tolmachev, Grant Trobridge, Beth Vorderstrasse, Douglas Weeks, John White, Lisa Woodard and Zhihong Zhang.

PHARS

502 Faculty Research in Pharmacology/Toxicology 1 Introduction to faculty research for incoming graduate students.

506 Principles of Pharmacology 3 Prereq MBioS 513 or c//. Mechanisms of drug action and the factors that modify drug responses; drug design and drug development.

507 Principles of Therapeutics 3 Prereq 300-level organ/mammalian physiology; P/T 506. Organ systems pharmacology, including drug actions, effects, side effects, and interaction of medications used in therapeutics.

510 Advanced Pharmacokinetics/Toxicokinetics 3 Prereq P/T 506. Kinetics of drug absorption, distribution, elimination, and pharmacologic response.

511 Topics in Toxicology V 1-4 May be repeated for credit; cumulative maximum 12 hours. Prereq by interview only. Topics of current interest in toxicology and closely related areas.

512 Topics in Pharmacology V 1-4 May be repeated for credit; cumulative maximum 12 hours. Prereq by interview only. Topics of current interest in pharmacology and closely related disciplines.

555 General and Cellular Physiology 4 (3-3) Prereq cell physiology or genetics course. Same as V Ph 555.

572 Fundamentals of Oncology 3 Prereq MBioS 513. Thorough overview of cancer biology encompassing basic cellular and molecular mechanisms of carcinogenesis and tumor progression, treatment and prevention.

573 Principles of Pharmacokinetics and Toxicokinetics 3 Pharmacokinetic, pharmacodynamic, and toxicokinetic systems; mathematical model development utilizing common kinetic systems.

574 Advanced Pharmacokinetics and Pharmacodynamics 4 Standard model development techniques to complex pharmacokinetic, pharmacokinetic-pharmacodynamic systems; advanced data analysis techniques to recover intrinsic kinetic and dynamic parameters.

575 Receptor-Ligand Interactions 3 Interactions of drugs with biological macromolecules constituting the physicochemical basis of drug action.

576 Biophysical Methods 3 Biophysical methods separating or detecting analytes based on their physical interactions with a support matrix or energy.

597 Pharmacology and Toxicology Seminar 1 May be repeated for credit; cumulative maximum 12 hours.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit; cumulative maximum 100 hours.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Pharmaceutical Sciences

Degree offered: Master of Science in Pharmaceutical Sciences

Faculty working with graduate students: 30

Program Description

Pharmaceutical Sciences Graduate Program offers a Ph.D. and prepares students for careers in teaching, research and public service. Potential employers of program graduates include colleges and universities, chemical manufacturers, the biotechnology and pharmaceutical industries, federal and private research institutes, and governmental regulatory agencies

Degree Description

The graduate program in Pharmaceutical Sciences has been awarding graduate degrees since 1931. This research-oriented program prepares students for careers in independent research and teaching in pharmacology, toxicology, and related fields. The program awards doctoral degrees.The research interests of the faculty are very broad; active areas of research include:cancer biology and therapy gene therapy and delivery pharmacokinetics proteomics reproductive biology neuropharmacology The diversity in faculty research interests provides students with a solid foundation in many areas of molecular, cellular, and whole animal pharmaceutical sciences, and gives them a wide variety of research programs from which a dissertation proposal may be selected.The curriculum provides students with exposure to virtually all areas of current research in molecular and cellular biochemistry, immunology, molecular biology, pharmacology, pharmaceutics, and toxicology. Formal course requirements are flexible to tailor programs to individual needs.The curriculum provides students with exposure to virtually all areas of current research in molecular and cellular biochemistry, immunology, molecular biology, pharmacology, pharmaceutics, and toxicology. Formal course requirements are flexible to tailor programs to individual needs.

Contact Information

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Faculty

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PHARS

511 Topics in Toxicology V 1-4 May be repeated for credit; cumulative maximum 12 hours. Prereq by interview only. Topics of current interest in toxicology and closely related areas.

512 Topics in Pharmacology V 1-4 May be repeated for credit; cumulative maximum 12 hours. Prereq by interview only. Topics of current interest in pharmacology and closely related disciplines.

555 General and Cellular Physiology 4 (3-3) Prereq cell physiology or genetics course. Same as V Ph 555.

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574 Advanced Pharmacokinetics and Pharmacodynamics 4 Standard model development techniques to complex pharmacokinetic, pharmacokinetic-pharmacodynamic systems; advanced data analysis techniques to recover intrinsic kinetic and dynamic parameters.

575 Receptor-Ligand Interactions 3 Interactions of drugs with biological macromolecules constituting the physicochemical basis of drug action.

576 Biophysical Methods 3 Biophysical methods separating or detecting analytes based on their physical interactions with a support matrix or energy.

597 Pharmacology and Toxicology Seminar 1 May be repeated for credit; cumulative maximum 12 hours.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Pharmaceutical Sciences

Degree offered: Master of Science in Pharmaceutical Sciences - Non Thesis

Program Description

Pharmaceutical Sciences Graduate Program offers a Ph.D. and prepares students for careers in teaching, research and public service. Potential employers of program graduates include colleges and universities, chemical manufacturers, the biotechnology and pharmaceutical industries, federal and private research institutes, and governmental regulatory agencies

Degree Description

The graduate program in Pharmaceutical Sciences has been awarding graduate degrees since 1931. This research-oriented program prepares students for careers in independent research and teaching in pharmacology, toxicology, and related fields. The program awards doctoral degrees.The research interests of the faculty are very broad; active areas of research include:cancer biology and therapy gene therapy and delivery pharmacokinetics proteomics reproductive biology neuropharmacology The diversity in faculty research interests provides students with a solid foundation in many areas of molecular, cellular, and whole animal pharmaceutical sciences, and gives them a wide variety of research programs from which a dissertation proposal may be selected.The curriculum provides students with exposure to virtually all areas of current research in molecular and cellular biochemistry, immunology, molecular biology, pharmacology, pharmaceutics, and toxicology. Formal course requirements are flexible to tailor programs to individual needs.The curriculum provides students with exposure to virtually all areas of current research in molecular and cellular biochemistry, immunology, molecular biology, pharmacology, pharmaceutics, and toxicology. Formal course requirements are flexible to tailor programs to individual needs.

Philosophy

Degree offered: Master of Arts in Philosophy

Faculty working with graduate students: 9

Graduate students: 13

Graduate students receiving assistantships or scholarships: 61%

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal)

Deadline: Fall: January 10
Spring: July 1

Program Description

The M.A. in Philosophy program helps students develop (i) depth of knowledge of philosophy, both generally and in specialized fields, (ii) creative philosophical thinking and mastery of philosophical research methods, and (iii) the abilities needed to communicate philosophical ideas effectively at a level appropriate for entry into Ph.D. programs in philosophy and/or application in professional fields.

Degree Description

The M.A. in Philosophy program helps students develop (i) depth of knowledge of philosophy, both generally and in specialized fields, (ii) creative philosophical thinking and mastery of philosophical research methods, and (iii) the abilities needed to communicate philosophical ideas effectively at a level appropriate for entry into Ph.D. programs in philosophy and/or application in professional fields.

Post-Graduate Employment Opportunities

Teaching at Community Colleges (many students go on to PhD and JD programs, see below)

Post-Graduate Career Placements

Graduate and Law Schools: University of California, Berkeley Law School; Southern Illinois University, Carbondale; University of Oregon; University of Calgary; University of Tennessee; Teaching Opportunities: University of Idaho (on-line course); Green River Community College; Highline Community College; Metropolitan State College of Denver; Mercer Community College; Camden Community College; Rider College

Contact Information

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Faculty

Aaron Bunch, Joseph Campbell, William Kabasenche, Noah Levin, Michael Myers, Nathaniel Nicol, David Shier, Robert Snyder and Matt Stichter.

PHIL

401 Advanced Logic 3 Prereq Phil 201. First-order predicate logic plus some metatheory, applications and/or extensions. Credit not granted for both Phil 401 and 501.

406 Philosophy and Race 3 Prereq 3 hours in Phil or CES 201. Same as CES 406.

407 Seminar in Philosophy of Religion 3 May be repeated for credit; cumulative maximum 6 hours. Advanced topic-driven seminar. Critical analysis of traditional and contemporary religions and religious phenomena. Credit not granted for both Phil 407 and 507.

413 Mind of God and the Book of Nature: Science and Religion 3 Prereq 3 hours Phil; completion of science General Education Requirements; completion of one Tier I and two Tier II courses. Methodological comparison; cutting edge issues in science as they impact theism; guest lectures from professors in the natural sciences.

420 Contemporary Continental Philosophy 3 Prereq 3 hours Phil. Selected movements, figures, and issues in recent continental philosophy.

421 Kant 3 Prereq 3 hours of philosophy. Exploration of Kant's philosophy and the philosophies heavily influenced by Kant.

425 Philosophy and Feminism 3 Prereq 3 hours Phil or W St 200. Feminist philosophy as critique of Western philosophical tradition and as alternate framework for thought.

431 Aesthetics and Philosophy of Art 3 Prereq 3 hours Phil; completion of one Tier I and three Tier II courses. Philosophical exploration of aesthetics experience and any or all of the arts; emphasis on value considerations and comparisons of differing media.

435 East/West Philosophy of Architecture 3 Prereq completion of one Tier I and three Tier II courses. East/West philosophies and their impact on understanding of nature and architecture.

442 Philosophy of Mind 3 Prereq 3 hours Phil. Theories of mind, self, mental acts, psychological states and artificial intelligence.

443 Philosophy of Language 3 Prereq 3 hours Phil. Investigation of philosophical issues concerning meaning, reference, truth, the nature of language, and the relation between language and thought. Credit not granted for both Phil 443 and 543.

446 Metaphysics 3 Prereq 3 hours Phil. Issues and theories concerning free will and determinism, the nature of truth, the existence of God, space, time and identity.

447 Theory of Knowledge 3 Prereq 3 hours Phil. Problems and theories concerning skepticism, the nature and scope of knowledge, a priori knowledge, and induction.

451 Philosophy of Biology 3 Prereq 3 hours Phil, 3 hours Biol. Conceptual problems and value questions in defining biology as a human endeavor and in defining its scope and its aims. Credit not granted for both Phil 451 and 551.

460 Ethical Theory 3 Prereq 3 hours in Phil. Problems of ethical theory as treated by historical and contemporary philosophers.

462 Women and Ethics 3 Prereq Phil 101 or W St 200. Same as W St 462.

470 Philosophy of Law 3 Prereq 3 hours in Phil. Selected topics pertaining to moral and philosophical evaluation of law. Credit not granted for both Phil 470 and 570.

472 Social and Political Philosophy 3 Prereq 3 hours Phil or Pol S. Problems of normative social and political theories; historical and contemporary philosophers.

499 Special Problems V 1 (0-3) to 4 (0-12) May be repeated for credit.

501 Advanced Logic 3 Prereq Phil 201. Graduate-level counterpart of Phil 401; additional requirements. Credit not granted for both Phil 401 and 501.

504 Special Topics in Philosophy 3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing. Intensive study of a special topic not otherwise covered in depth in the curriculum.

507 Seminar in Philosophy of Religion 3 Graduate-level counterpart of Phil 407; additional requirements. Credit not granted for both Phil 407 and 507.

510 Seminar in the History of Philosophy 3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing. Systematic exploration of the central works of an individual philosopher or philosophical movement.

520 Seminar in Ethical Theory 3 Prereq graduate standing. The major issues, views, and figures of ethical theory from ancient Greece to the present.

522 Seminar in Metaphysics 3 Prereq graduate standing. The nature of reality, through study of key concepts such as God, personhood, free will, causation, space, time, and identity.

524 Seminar in Epistemology 3 Prereq graduate standing. Classical problems, questions, and theories involving the concept of knowledge.

530 Bioethics 2 Prereq graduate standing. Professional ethics for scientists; ethical implications of new technologies; obligations to human and non-human research subjects.

532 Seminar in Business Ethics 3 Prereq graduate standing. The major issues in business ethics, both domestic and international, from general principles to specific cases.

535 Advanced Biomedical Ethics 3 Current ethical issues in medical practice, medical research and public policy relating to health issues.

543 Philosophy of Language 3 Graduate-level counterpart of Phil 443, additional requirements. Credit not granted for both Phil 443 and 543.

551 Philosophy of Biology 3 Graduate-level counterpart of Phil 451; additional requirements. Credit not granted for both Phil 451 and 551.

552 Environmental Philosophy 3 Prereq graduate standing. Philosophical examination of various ethical, metaphysical and legal issues concerning humans, nature and the environment.

556 Religion and Environment 3 Concepts of the sacred, the human and nature and their interrelationships with religious traditions and how they relate to ecology and environmental ethics.

570 Philosophy of Law 3 Graduate-level counterpart of Phil 470, additional requirements. Credit not granted for both Phil 470 and 570.

571 Ecological Jurisprudence 3 Prereq graduate standing. Nature of law at the intersection of nature and culture including influences from the philosophy of pragmatism.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Physics

Degree offered: Doctor of Philosophy (Physics)

Faculty working with graduate students: 30

Graduate students: 69

Graduate students receiving assistantships or scholarships: 100%

Tests required: TOEFL, TOEFLI

Deadline: Fall: April 1
Spring: October 1

Requirements

Transfer credit is limited to no more than half of the total graded course credits required by the department for the master's degree. None of these credits may be applied toward another advanced degree at WSU. Students wanting to transfer course work should talk to the chair of the Graduate Studies Committee immediately upon enrolling at Washington State University. All transfer work under consideration must have a grade of "A-" or better and be no more than 10 years old at time of submission on the program of study. Additional restrictions may apply.

Program Description

The Department of Physics and Astronomy at Washington State University offers three graduate degrees: the doctorate, the thesis master's, and the non-thesis master's. They are designed to give every student a thorough background in the major areas of current research. We seek to provide an atmosphere that fosters intellectual growth and quantitative reasoning. We offer educational programs in physics and astronomy that engage students in teaching and research activities that provide the skills, knowledge, and ability for critical thinking that will enable them to be productive members of society. In the process, we will lay the foundations for technological advances that improve our quality of life. The department emphasizes a friendly, informal atmosphere, where students can tailor their programs to specific needs, interests and scholarship.

Degree Description

The Department of Physics and Astronomy doctoral program at Washington State University is designed to produce leaders in industry, in academia, and at national laboratories. The department's progressive environment seeks to provide an atmosphere that fosters intellectual growth and quantitative reasoning. The program engages students in teaching and research activities that provide the skills, knowledge, and ability for critical thinking that will enable them to be productive members of society. In the process, our goal is to lay the foundations for technological advances that improve our quality of life.

Post-Graduate Employment Opportunities

While the Department of Physics and Astronomy conducts research in the traditional areas of physics, it has enhanced its program by focusing on three areas of research excellence: Astrophysics, Extreme Matter, and Materials and Optics. Astrophysics seeks to answer some of the most basic questions about the universe and space-time and is in high demand from the students. Materials and Optics, and Extreme Matter are at the forefront of important technological advances. These research areas are supported by two WSU research units, the Center for Materials Research (CMR) and Institute for Shock Physics (ISP) as well as unique regional facilities such as the Pacific Northwest National Laboratory (PNNL) and the Laser Interferometer Gravitational Observatory (LIGO). Students gain international exposure through conferences, collaborations, and a cooperative agreement between WSU and the Katholieke University of Leuven (KUL), Belgium that allows students to pursue a joint degree between the two institutions. We have secured external funding that directly strengthens our graduate program. The US Department of Education's Graduate Assistantships in Areas of National Need (GAANN) grant is a professional training program, which provides greater opportunities for our students to gain experience in classroom and laboratory education techniques.

Post-Graduate Career Placements

Postdoctoral positions; Physics research - industrial and applied physics at national labs such as Sandia, Los Alamos, Lawrence Livermore, etc.; engineering physics jobs; university teaching/research positions.

Contact Information

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Faculty

Michael Allen, James Asay, John Blakeslee, Doerte Blume, Sukanta Bose, Nicholas Cerruti, Santanu Chaudhuri, Koen Clays, Gary Collins, Susan Dexheimer, J Dickinson, Matthew Duez, Peter Engels, Frederick Gittes, Yi Gu, Yogendra Gupta, Mark Kuzyk, Kelvin Lynn, Richard Lytel, Philip Marston, Matthew McCluskey, Michael Miller, Frederick Raab, David Rector, Farida Selim, Steven Tomsovic, Guy Worthey, Choong-Shik Yoo, Matthew Zacate and Chuanwei Zhang.

ASTR

581 Advanced Topics 3 May be repeated for credit; cumulative maximum 12 hours. Same as Phys 581.

CHEM

509 Chemical Group Theory 3 Mathematical definitions of groups and representations, applications to chemical structure and spectra, ligand field theory, chemical reactions and selection rules.

536 Quantum Chemistry 3 Prereq Chem 532 or equivalent. Quantum mechanics applied to chemical problems: states of atoms and molecules, transitions and spectra, ladder operators and many electron methods.

564 Molecular Phenomena 3 Phenomena which yield information on structures, energy levels, and interactions of molecules in solid, liquid, and gaseous phases.

CPT S

530 Numerical Analysis 3 Prereq FORTRAN, C, or other programming language; Math 315; graduate standing. Graduate-level counterpart of Cpt S 430; additional requirements. Credit not granted for both Cpt S 430 and 530.

580 Advanced Topics in Computer Science 3 May be repeated for credit.

Electrical Engineering

E E

496 Introduction to Semiconductor Device Theory 3 Prereq E E 311 or MSE 302; Stat 360 or 443. Equilibrium statistics of electrons and holes; carrier dynamics; p-n junctions, metal-semiconductor junctions, BJTs, Mosfets, LEDs.

504 Modern Optics 3 Prereq E E 341, 351, Stat 443. Diffraction theory, Fourier transforming and imaging properties of lenses, spatial filtering, holography, temporal and spatial coherence, imaging through random media.

520 Plasma Engineering 3 Prereq E E 351 or Phys 342. Electromagnetics, kinetic theory, and fluid mechanics of plasmas in space, arcs, plasma processing, coronas, and fusion reactors.

528 Advanced Topics in Electromagnetics 3 May be repeated for credit; cumulative maximum 6 hours. Prereq E E 351. Advanced topics of current interest in wave propagation (electromagnetics, acoustics, or optics).

535 Numerical Solutions to EM Problems I 3 Prereq E E 351. Theory and use of finite-difference time-domain; numeric dispersion; absorbing boundary conditions; scattering; radiation; time-domain vs. frequency-domain.

596 Advanced Analog Integrated Circuits 3 Prereq E E 476, 477. MOS and BiCMOS technologies; MOS and BiCMOS operational amplifiers; A/D, D/A converters; switched-capacitor filters; continuous-time filters.

Mechanical Engineering

M E

501 Continuum Mechanics 3 Prereq graduate standing. Unified presentation of principles common to all branches of solid and fluid mechanics; viscous fluids, elasticity, viscoelasticity, and plasticity.

509 MEMS Engineering 3 (2-3) Prereq graduate standing or permission of instructor. Introduction to the design, fabrication and application of microelectromechanical systems.

530 Elasticity 3 Prereq M E 414; graduate standing. Theory of kinematics of solid deformable bodies; conservation laws applied to an elastic continuum; generalized linear stress-strain behavior with applications.

Mechanical Engineering

MAT S

505 Advanced Materials Science 3 Same as MSE 505.

571 Microscopic Analysis of Solid Surfaces 3 Modern spectroscopic methods for microscopic analysis of solid surfaces; emphasizes electron, ion, laser, and x-ray techniques.

Mechanical Engineering

MATH

501 Real Analysis 3 Prereq Math 402. Metric spaces, convergence, continuous functions, infinite series, differentiation and integration of functions of one and several variables.

540 Applied Mathematics I 3 Prereq Math 315, graduate standing. Graduate-level counterpart of Math 440; additional requirements. Credit not granted for both Math 440 and 540.

541 Applied Mathematics II 3 Prereq Math 315, graduate standing. Graduate-level counterpart of Math 441; additional requirements. Credit not granted for both Math 441 and 541.

544 Advanced Matrix Computations 3 Prereq Math 448. Advanced topics in the solution of linear systems and eigenvalue problems, including parallel matrix computations.

546 Numerical Analysis of Elliptic PDEs 3 Prereq Math 448. Methods of discretizing elliptic partial differential equations and solving the resulting systems of equations; error analysis.

548 Numerical Analysis 3 Prereq FORTRAN, C, or other programming language; Math 315; graduate standing. Graduate-level counterpart of Math 448; additional requirements. Credit not granted for both Math 448 and 548.

570 Mathematical Foundations of Continuum Mechanics I 3 Prereq advanced calculus and differential equations. The basic mathematical theory of continuum mechanics and its relation to perturbation techniques and stability methods.

Materials Science And Engineering

MSE

505 Advanced Materials Science 3 Broad baseline in materials science including relationships between structure and properties.

515 Electronic Properties of Materials 3 Electron energy bands in solids, electrical conduction in metals and semiconductors, applications to semi-conduction devices based on silicon and III-V compounds.

Materials Science And Engineering

PHYS

501 Graduate Seminar 1 Introduction to graduate and interdisciplinary research.

514 Optoelectronics Lab I 1 (0-3) May be repeated for credit; cumulative maximum 3 hours. Prereq graduate standing. Experiments with optical systems: Imaging, interference, coherence, information storage/processing, gas and solid state lasers, optical fibers, and communications systems.

515 Optoelectronics Lab II V 1 (0-3) to 3 (0-9) May be repeated for credit; cumulative maximum 3 hours. Prereq graduate standing. Experiments in optical physics, physical properties of light, laser physics, waveguides, quantum confined semiconductor structures and ultrafast dynamics and nonlinear optics.

522 Classical Mechanics II 3 Prereq Phys 521. Continuation of Phys 521. Classical mechanics of liquids and deformable solids; stress, deformation and strain, flow, oscillations and waves.

534 Thermal and Statistical Physics II 3 Prereq Chem 531, 535; or Phys 533, 551. Phase transitions and critical phenomena, Ginzburg-Landau theory, Bose-Einstein condensation, superfluids, Fermi systems, low-temperature expansions.

545 Nonlinear Optics 3 Prereq Phys 534, 542, 551. Nonlinear wave propagation theory applied to several nonlinear-optical phenomena; experimental techniques that probe a material's nonlinearity.

546 Quantum Electronics 3 Prereq Phys 541, 551 or c//. The physics of lasers and of coherent optical radiation generation and propagation.

552 Quantum Theory III 3 Prereq Phys 551. Scattering theory; relativistic wave mechanics; quantum field theory.

561 Atomic and Molecular Physics 3 Prereq Phys 550. Physics of atoms and molecules using quantum theory.

563 Physics of the Solid State 3 Prereq Phys 534, 551. Lattice vibrations and defects; ionic and electronic conductivities; band theory; magnetic properties; luminescence.

566 Biological Physics 3 Graduate-level counterpart of Phys 466; additional requirements. Credit not granted for both Phys 466 and 566.

575 Advanced Solid State Physics 3 Prereq Phys 534, 542, 552 or c//, 563, 571. Quantum theory of solids; Green's functions, correlation functions and other field-theoretic methods; magnetism, superconductivity and transport properties.

581 Advanced Topics 3 May be repeated for credit; cumulative maximum 12 hours. Topics of current interest in advanced physics.

590 Seminar 1 May be repeated for credit.

592 Wave Propagation Seminar 2 May be repeated for credit; cumulative maximum 4 hours. Prereq Math 440, 441. Waves in the continuum; elastic, plastic, and hydrodynamic waves; shock waves.

598 Teaching Undergraduate Physics Laboratories 1 May be repeated for credit; cumulative maximum 4 hours. Principles and practices of teaching, planning and management of undergraduate physics laboratories; choice and care of equipment.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Materials Science And Engineering

PHYS

521 Classical Mechanics I 3 Prereq Phys 320; 571 or c//. Laws of motion as developed by Newton, d'Alembert, Lagrange, and Hamilton; dynamics of particles and rigid bodies.

533 Thermal and Statistical Physics I 3 Prereq Math 440; Phys 330. Thermodynamic laws and potentials, kinetic theory, hydrodynamics and transport coefficients; introduction to statistical mechanics, ensembles, partition functions.

541 Electromagnetic Theory 3 Prereq Phys 342, 571 or c//. Special relativity and the classical electromagnetic field; emission, propagation, and absorption of electromagnetic waves.

542 Electrodynamics 3 Prereq Phys 541. Interaction of matter and electromagnetic radiation; classical and quantum electrodynamics.

550 Quantum Theory I 3 Prereq Math 440, 441; Phys 450. Introduction to quantum theory; physical and mathematical foundations; application to atomic systems.

551 Quantum Theory II 3 Prereq Phys 550, 571. Symmetry and invariance; angular momentum theory; approximation methods.

571 Methods of Theoretical Physics 3 Prereq Math 440, 441. Mathematical methods for theoretical physics; linear algebra, tensor analysis, complex variables, differential equations, integral equations, variational calculus, and group theory.

Materials Science And Engineering

STAT

512 Statistical Methods in Research II 3 (2-2) Prereq Stat 412 or equivalent. Analysis and interpretation of designed experiments: CRD, RCBD, spit-plot and repeated measures, multiple comparisons, multiple regression modeling, validation of assumptions.

Physics

Degree offered: Master of Science in Physics

Faculty working with graduate students: 30

Graduate students: 4

Graduate students receiving assistantships or scholarships: 50%

Tests required: TOEFL, TOEFLI

Deadline: Fall: April 1
Spring: October 1

Requirements

M.S. Thesis: The program must consist of a minimum of 30 semester hours of approved graduate credit, including 21 hours of graded 500-level course work (18 of which must be in the physics core curriculum); additional course work may include 3 or more credits of physics electives or, approved courses taught outside of the department; a minimum of 4 total hours of 700-Master's Research; 4 hours of seminar credit; and includes a substantial thesis project. Time required for completion is about three years. A bound copy of the the thesis is required by the department.Transfer credit is limited to no more than half of the total graded course credits required by the department for the master's degree. None of these credits may be applied toward another advanced degree at WSU. Students wanting to transfer course work should talk to the chair of the Graduate Studies Committee immediately upon enrolling at Washington State University. All transfer work under consideration must have a grade of "A-" or better and be no more than 10 years old at time of submission on the program of study. Additional restrictions may apply.

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The Department of Physics and Astronomy at Washington State University offers three graduate degrees: the doctorate, the thesis master's, and the non-thesis master's. They are designed to give every student a thorough background in the major areas of current research. We seek to provide an atmosphere that fosters intellectual growth and quantitative reasoning. We offer educational programs in physics and astronomy that engage students in teaching and research activities that provide the skills, knowledge, and ability for critical thinking that will enable them to be productive members of society. In the process, we will lay the foundations for technological advances that improve our quality of life. The department emphasizes a friendly, informal atmosphere, where students can tailor their programs to specific needs, interests and scholarship.

Degree Description

The Department of Physics and Astronomy master's program at Washington State University is designed to produce leaders in industry, in academia, and at national laboratories. The department's progressive environment seeks to provide an atmosphere that fosters intellectual growth and quantitative reasoning. The program engages students in teaching and research activities that provide the skills, knowledge, and ability for critical thinking that will enable them to be productive members of society. In the process, our goal is to lay the foundations for technological advances that improve our quality of life.

Training and Professional Development Opportunities

While the Department of Physics and Astronomy conducts research in the traditional areas of physics, it has enhanced its program by focusing on three areas of research excellence: Astrophysics, Extreme Matter, and Materials and Optics. Astrophysics seeks to answer some of the most basic questions about the universe and space-time and is in high demand from the students. Materials and Optics, and Extreme Matter are at the forefront of important technological advances. These research areas are supported by two WSU research units, the Center for Materials Research (CMR) and Institute for Shock Physics (ISP) as well as unique regional facilities such as the Pacific Northwest National Laboratory (PNNL) and the Laser Interferometer Gravitational Observatory (LIGO.

Post-Graduate Employment Opportunities

Engineering positions at Boeing and Lockheed Corporations; NASA; Lawrence Livermore National Laboratory; Los Alamos National Laboratory; Schweitzer Engineering, NASA Jet Propulsion Laboratory

Post-Graduate Career Placements

Senior computer scientist; science historian; staff scientist in applied research; meteorology; space industry; fiber optics; oceanic exploration

Contact Information

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Faculty

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ASTR

581 Advanced Topics 3 May be repeated for credit; cumulative maximum 12 hours. Same as Phys 581.

CHEM

509 Chemical Group Theory 3 Mathematical definitions of groups and representations, applications to chemical structure and spectra, ligand field theory, chemical reactions and selection rules.

536 Quantum Chemistry 3 Prereq Chem 532 or equivalent. Quantum mechanics applied to chemical problems: states of atoms and molecules, transitions and spectra, ladder operators and many electron methods.

564 Molecular Phenomena 3 Phenomena which yield information on structures, energy levels, and interactions of molecules in solid, liquid, and gaseous phases.

CPT S

530 Numerical Analysis 3 Prereq FORTRAN, C, or other programming language; Math 315; graduate standing. Graduate-level counterpart of Cpt S 430; additional requirements. Credit not granted for both Cpt S 430 and 530.

580 Advanced Topics in Computer Science 3 May be repeated for credit.

Electrical Engineering

E E

496 Introduction to Semiconductor Device Theory 3 Prereq E E 311 or MSE 302; Stat 360 or 443. Equilibrium statistics of electrons and holes; carrier dynamics; p-n junctions, metal-semiconductor junctions, BJTs, Mosfets, LEDs.

504 **Modern Optics** 3 Prereq E E 341, 351, Stat 443. Diffraction theory, Fourier transforming and imaging properties of lenses, spatial filtering, holography, temporal and spatial coherence, imaging through random media.

520 **Plasma Engineering** 3 Prereq E E 351 or Phys 342. Electromagnetics, kinetic theory, and fluid mechanics of plasmas in space, arcs, plasma processing, coronas, and fusion reactors.

528 **Advanced Topics in Electromagnetics** 3 May be repeated for credit; cumulative maximum 6 hours. Prereq E E 351. Advanced topics of current interest in wave propagation (electromagnetics, acoustics, or optics).

535 **Numerical Solutions to EM Problems I** 3 Prereq E E 351. Theory and use of finite-difference time-domain; numeric dispersion; absorbing boundary conditions; scattering; radiation; time-domain vs. frequency-domain.

596 **Advanced Analog Integrated Circuits** 3 Prereq E E 476, 477. MOS and BiCMOS technologies; MOS and BiCMOS operational amplifiers; A/D, D/A converters; switched-capacitor filters; continuous-time filters.

Mechanical Engineering

M E

501 **Continuum Mechanics** 3 Prereq graduate standing. Unified presentation of principles common to all branches of solid and fluid mechanics; viscous fluids, elasticity, viscoelasticity, and plasticity.

509 **MEMS Engineering** 3 (2-3) Prereq graduate standing or permission of instructor. Introduction to the design, fabrication and application of microelectromechanical systems.

Mechanical Engineering

MAT S

505 **Advanced Materials Science** 3 Same as MSE 505.

571 **Microscopic Analysis of Solid Surfaces** 3 Modern spectroscopic methods for microscopic analysis of solid surfaces; emphasizes electron, ion, laser, and x-ray techniques.

Mechanical Engineering

MATH

501 **Real Analysis** 3 Prereq Math 402. Metric spaces, convergence, continuous functions, infinite series, differentiation and integration of functions of one and several variables.

540 **Applied Mathematics I** 3 Prereq Math 315, graduate standing. Graduate-level counterpart of Math 440; additional requirements. Credit not granted for both Math 440 and 540.

541 **Applied Mathematics II** 3 Prereq Math 315, graduate standing. Graduate-level counterpart of Math 441; additional requirements. Credit not granted for both Math 441 and 541.

544 **Advanced Matrix Computations** 3 Prereq Math 448. Advanced topics in the solution of linear systems and eigenvalue problems, including parallel matrix computations.

546 **Numerical Analysis of Elliptic PDEs** 3 Prereq Math 448. Methods of discretizing elliptic partial differential equations and solving the resulting systems of equations; error analysis.

548 **Numerical Analysis** 3 Prereq FORTRAN, C, or other programming language; Math 315; graduate standing. Graduate-level counterpart of Math 448; additional requirements. Credit not granted for both Math 448 and 548.

570 **Mathematical Foundations of Continuum Mechanics I** 3 Prereq advanced calculus and differential equations. The basic mathematical theory of continuum mechanics and its relation to perturbation techniques and stability methods.

Materials Science And Engineering

MSE

505 **Advanced Materials Science** 3 Broad baseline in materials science including relationships between structure and properties.

515 **Electronic Properties of Materials** 3 Electron energy bands in solids, electrical conduction in metals and semiconductors, applications to semi-conduction devices based on silicon and III-V compounds.

Materials Science And Engineering

PHYS

501 **Graduate Seminar** 1 Introduction to graduate and interdisciplinary research.

514 **Optoelectronics Lab I** 1 (0-3) May be repeated for credit; cumulative maximum 3 hours. Prereq graduate standing. Experiments with optical systems: Imaging, interference, coherence, information storage/processing, gas and solid state lasers, optical fibers, and communications systems.

515 **Optoelectronics Lab II** V 1 (0-3) to 3 (0-9) May be repeated for credit; cumulative maximum 3 hours. Prereq graduate standing. Experiments in optical physics, physical properties of light, laser physics, waveguides, quantum confined semiconductor structures and ultrafast dynamics and nonlinear optics.

521 **Classical Mechanics I** 3 Prereq Phys 320; 571 or c//. Laws of motion as developed by Newton, d'Alembert, Lagrange, and Hamilton; dynamics of particles and rigid bodies.

522 **Classical Mechanics II** 3 Prereq Phys 521. Continuation of Phys 521. Classical mechanics of liquids and deformable solids; stress, deformation and strain, flow, oscillations and waves.

533 **Thermal and Statistical Physics I** 3 Prereq Math 440; Phys 330. Thermodynamic laws and potentials, kinetic theory, hydrodynamics and transport coefficients; introduction to statistical mechanics, ensembles, partition functions.

534 **Thermal and Statistical Physics II** 3 Prereq Chem 531, 535; or Phys 533, 551. Phase transitions and critical phenomena, Ginzburg-Landau theory, Bose-Einstein condensation, superfluids, Fermi systems, low-temperature expansions.

541 **Electromagnetic Theory** 3 Prereq Phys 342, 571 or c//. Special relativity and the classical electromagnetic field; emission, propagation, and absorption of electromagnetic waves.

542 **Electrodynamics** 3 Prereq Phys 541. Interaction of matter and electromagnetic radiation; classical and quantum electrodynamics.

545 **Nonlinear Optics** 3 Prereq Phys 534, 542, 551. Nonlinear wave propagation theory applied to several nonlinear-optical phenomena; experimental techniques that probe a material's nonlinearity.

546 **Quantum Electronics** 3 Prereq Phys 541, 551 or c//. The physics of lasers and of coherent optical radiation generation and propagation.

550 **Quantum Theory I** 3 Prereq Math 440, 441; Phys 450. Introduction to quantum theory; physical and mathematical foundations; application to atomic systems.

551 **Quantum Theory II** 3 Prereq Phys 550, 571. Symmetry and invariance; angular momentum theory; approximation methods.

552 **Quantum Theory III** 3 Prereq Phys 551. Scattering theory; relativistic wave mechanics; quantum field theory.

561 Atomic and Molecular Physics 3 Prereq Phys 550. Physics of atoms and molecules using quantum theory.

563 Physics of the Solid State 3 Prereq Phys 534, 551. Lattice vibrations and defects; ionic and electronic conductivities; band theory; magnetic properties; luminescence.

566 Biological Physics 3 Graduate-level counterpart of Phys 466; additional requirements. Credit not granted for both Phys 466 and 566.

571 Methods of Theoretical Physics 3 Prereq Math 440, 441. Mathematical methods for theoretical physics; linear algebra, tensor analysis, complex variables, differential equations, integral equations, variational calculus, and group theory.

575 Advanced Solid State Physics 3 Prereq Phys 534, 542, 552 or c//, 563, 571. Quantum theory of solids; Green's functions, correlation functions and other field-theoretic methods; magnetism, superconductivity and transport properties.

581 Advanced Topics 3 May be repeated for credit; cumulative maximum 12 hours. Topics of current interest in advanced physics.

590 Seminar 1 May be repeated for credit.

592 Wave Propagation Seminar 2 May be repeated for credit; cumulative maximum 4 hours. Prereq Math 440, 441. Waves in the continuum; elastic, plastic, and hydrodynamic waves; shock waves.

598 Teaching Undergraduate Physics Laboratories 1 May be repeated for credit; cumulative maximum 4 hours. Principles and practices of teaching, planning and management of undergraduate physics laboratories; choice and care of equipment.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Materials Science And Engineering

STAT

512 Statistical Methods in Research II 3 (2-2) Prereq Stat 412 or equivalent. Analysis and interpretation of designed experiments: CRD, RCBD, spit-plot and repeated measures, multiple comparisons, multiple regression modeling, validation of assumptions.

Physics

Degree offered: Master of Science in Physics - Non Thesis

Faculty working with graduate students: 30

Graduate students: 2

Graduate students receiving assistantships or scholarships: 100%

Tests required: TOEFL, TOEFLI

Deadline: Fall: April 1
Spring: October 1

Requirements

The Master of Science in Physics Non-Thesis program must include a minimum of 30 semester hours of approved graded 500-level course work in physics; 18 credits must be in the Ph.D. core curriculum; plus 4 hours of seminar credit and a minimum of 4 credits of Phys 702. Time required for completion is about two years.Transfer credit is limited to no more than half of the total graded course credits required y the department for the master's degree. None of these credits may be applied toward another advanced degree at WSU. Students wanting to transfer course work should talk to the chair of the Graduate Studies Committee immediately upon enrolling at Washington State University. All transfer work under consideration must have a grade of "A-" or better and be no more than 10 years old at time of submission on the program of study. Additional restrictions may apply.Final Examination: A final oral examination is required of all master's candidates. This examination is intended to test the candidate's ability to integrate and interpret material in the major and supporting fields with emphasis on the work presented in the thesis or special problem.

Program Description

The Department of Physics and Astronomy at Washington State University offers three graduate degrees: the doctorate, the thesis master's, and the non-thesis master's. They are designed to give every student a thorough background in the major areas of current research. We seek to provide an atmosphere that fosters intellectual growth and quantitative reasoning. We offer educational programs in physics and astronomy that engage students in teaching and research activities that provide the skills, knowledge, and ability for critical thinking that will enable them to be productive members of society. In the process, we will lay the foundations for technological advances that improve our quality of life. The department emphasizes a friendly, informal atmosphere, where students can tailor their programs to specific needs, interests and scholarship.

Degree Description

The Department of Physics and Astronomy master's program at Washington State University is designed to produce leaders in industry, in academia, and at national laboratories. The department's progressive environment seeks to provide an atmosphere that fosters intellectual growth and quantitative reasoning. The program engages students in teaching and research activities that provide the skills, knowledge, and ability for critical thinking that will enable them to be productive members of society. In the process, our goal is to lay the foundations for technological advances that improve our quality of life.

Post-Graduate Employment Opportunities

Physics and biology faculty; engineering in aerospace industries; senior computer analysts; science historians; staff scientists in applied research; meteorology; appointments in the Department of Energy, Office of Basic Energy Sciences, and NASA Jet Propulsion; fiber optics

Faculty

Michael Allen, James Asay, John Blakeslee, Doerte Blume, Sukanta Bose, Nicholas Cerruti, Santanu Chaudhuri, Koen Clays, Gary Collins, Susan Dexheimer, J Dickinson, Matthew Duez, Peter Engels, Frederick Gittes, Yi Gu, Yogendra Gupta, Mark Kuzyk, Kelvin Lynn, Richard Lytel, Philip Marston, Matthew McCluskey, Michael Miller, Frederick Raab, David Rector, Farida Selim, Steven Tomsovic, Guy Worthey, Choong-Shik Yoo, Matthew Zacate and Chuanwei Zhang.

ASTR

581 Advanced Topics 3 May be repeated for credit; cumulative maximum 12 hours. Same as Phys 581.

CHEM

509 Chemical Group Theory 3 Mathematical definitions of groups and representations, applications to chemical structure and spectra, ligand field theory, chemical reactions and selection rules.

536 Quantum Chemistry 3 Prereq Chem 532 or equivalent. Quantum mechanics applied to chemical problems: states of atoms and molecules, transitions and spectra, ladder operators and many electron methods.

564 Molecular Phenomena 3 Phenomena which yield information on structures, energy levels, and interactions of molecules in solid, liquid, and gaseous phases.

CPT S

580 Advanced Topics in Computer Science 3 May be repeated for credit.

Electrical Engineering

E E

496 Introduction to Semiconductor Device Theory 3 Prereq E E 311 or MSE 302; Stat 360 or 443. Equilibrium statistics of electrons and holes; carrier dynamics; p-n junctions, metal-semiconductor junctions, BJTs, Mosfets, LEDs.

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509 MEMS Engineering 3 (2-3) Prereq graduate standing or permission of instructor. Introduction to the design, fabrication and application of microelectromechanical systems.

530 Elasticity 3 Prereq M E 414; graduate standing. Theory of kinematics of solid deformable bodies; conservation laws applied to an elastic continuum; generalized linear stress-strain behavior with applications.

Mechanical Engineering

MAT S

505 Advanced Materials Science 3 Same as MSE 505.

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Materials Science And Engineering

PHYS

515 Optoelectronics Lab II V 1 (0-3) to 3 (0-9) May be repeated for credit; cumulative maximum 3 hours. Prereq graduate standing. Experiments in optical physics, physical properties of light, laser physics, waveguides, quantum confined semiconductor structures and ultrafast dynamics and nonlinear optics.

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534 Thermal and Statistical Physics II 3 Prereq Chem 531, 535; or Phys 533, 551. Phase transitions and critical phenomena, Ginzburg-Landau theory, Bose-Einstein condensation, superfluids, Fermi systems, low-temperature expansions.

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581 **Advanced Topics** 3 May be repeated for credit; cumulative maximum 12 hours. Topics of current interest in advanced physics.

590 **Seminar** 1 May be repeated for credit.

598 **Teaching Undergraduate Physics Laboratories** 1 May be repeated for credit; cumulative maximum 4 hours. Principles and practices of teaching, planning and management of undergraduate physics laboratories; choice and care of equipment.

600 **Special Projects or Independent Study** V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 **Master's Special Problems, Directed Study and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

Materials Science And Engineering

STAT

512 **Statistical Methods in Research II** 3 (2-2) Prereq Stat 412 or equivalent. Analysis and interpretation of designed experiments: CRD, RCBD, spit-plot and repeated measures, multiple comparisons, multiple regression modeling, validation of assumptions.

Plant Pathology

Degree offered: Doctor of Philosophy (Plant Pathology)

Faculty working with graduate students: 31

Graduate students: 44

Graduate students receiving assistantships or scholarships: 100%

Tests required: IELTS, TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Program Description

Plant Pathology is the study of plant diseases caused by pathogens and environmental factors; it involves study in mycology, bacteriology, nematology, virology, disease physiology and biochemistry, molecular biology of host-parasite relationships, etiology, ecology and epidemiology of plant diseases, disease resistance, and integrated disease management by developing and deploying cultural, chemical, biological, and biotechonological approaches. Because of its broad mission, the Department of Plant Pathology has strong interrelationships with all other plant- and biology-oriented departments and commodity groups within the state and nationally and internationally. The mission of the department reflects the strategic goals of Washington State University by advancing knowledge of plant pathology through creative research and scholarship, by extending that knowledge worldwide through the training of graduate students, and by applying the knowledge to protect the quality and quantity of the local and global food supply.The courses offered in this department are designed both to train students expecting to make plant pathology their professional field of specialization and to provide supplementary training for students in other biological and agricultural fields, particularly botany, crop science, genetics, horticulture, forestry, and entomology. Students who expect to become professional plant pathologists are advised to include in their undergraduate studies fundamental courses in botany, chemistry, genetics, microbiology, physics, and zoology.Preparation for Graduate StudyAs preparation for work toward an advanced degree, a student should have completed a bachelor's degree; at least one semester each of general inorganic chemistry, botany, zoology, physics; one semester each of systematic botany, plant physiology, general plant pathology, entomology, microbiology, precalculus, organic chemistry, genetics, and report writing or advanced composition.

Degree Description

Doctorate in Plant Pathology requires graded course work and completion of dissertation research. The degree involves study in mycology, bacteriology, nematology, virology, disease physiology and biochemistry, molecular biology of host-parasite relationships, etiology, ecology and epidemiology of plant diseases, disease resistance, and integrated disease management by developing and deploying cultural, chemical, biological, and biotechonological approaches.

Contact Information

Mary Stormo
Program Coordinator
Plant Pathology
P. O. Box 646430
Pullman, WA 99164-6430
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Fax: 509.335.9581
E-mail: stormom@wsu.edu; OR plpath-students@wsu.edu

Faculty

Lori Carris, Gary Chastagner, Weidong Chen, Xianming Chen, Frank Dugan, Lindsey Dutoit, Kenneth Eastwell, Axel Elling, Dean Glawe, Gary Grove, Lee Hadwiger, Scot Hulbert, Debra Inglis, Dennis Johnson, Ned Klopfenstein, Richard Larsen, Mark Mazzola, Timothy Murray, Duroy Navarre, Patricia Okubara, Hanu Pappu, Tim Paulitz, Tobin Peever, Naidu Rayapati, Jack Rogers, Brenda Schroeder, Deven See, Linda Thomashow, George Vandemark, David Weller and Chang-Lin Xiao.

PL P

511 **Viruses and Virus Diseases of Plants** 4 (3-3) Prereq course in biochemistry or advanced genetics. Nature of plant viruses, vector-virus relationships and virus diseases of plants.

513 **Plant Nematology** 4 (3-3) Anatomy and morphology of plant-parasitic nematodes, molecular plant-nematode interactions, genomics, symptoms, identification, techniques and control.

514 **Phytobacteriology** 4 (3-3) Prereq MBioS 303; MBioS 305. Isolation and characterization of bacteria having a saprophytic, symbiotic or pathogenic association with plants, molecular structure, function, and genetics.

515 Seminar 1 May be repeated for credit.

521 General Mycology 4 (2-6) The structure, life histories, classification, and economic importance of the fungi.

525 Field Plant Pathology and Mycology V 1 (0-3) to 2 (0-6) May be repeated for credit; cumulative maximum 4 hours. Field trips, forays, and demonstrations dealing with various aspects of plant pathology and mycology.

526 Advanced Fungal Biology 4 (2-6) Prereq Pl P 421, 521 and graduate standing. Advanced topics in fungal biology, ecology, systematics, evolution and coevolution via discussions of literature and special laboratory projects.

535 Molecular Genetics of Plant and Pathogen Interactions 3 Prereq MBioS 301, 303. Genetic and molecular biological aspects of host-pathogen interactions.

551 Epidemiology and Management of Plant Diseases 3 Prereq Pl P 429 or 529. Principles of plant disease epidemiology, control and ecology of pathogens.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Plant Pathology

Degree offered: Master of Science in Plant Pathology

Faculty working with graduate students: 31

Graduate students: 11

Graduate students receiving assistantships or scholarships: 100%

Tests required: IELTS, TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Program Description

Plant Pathology is the study of plant diseases caused by pathogens and environmental factors; it involves study in mycology, bacteriology, nematology, virology, disease physiology and biochemistry, molecular biology of host-parasite relationships, etiology, ecology and epidemiology of plant diseases, disease resistance, and integrated disease management by developing and deploying cultural, chemical, biological, and biotechonological approaches. Because of its broad mission, the Department of Plant Pathology has strong interrelationships with all other plant- and biology-oriented departments and commodity groups within the state and nationally and internationally. The mission of the department reflects the strategic goals of Washington State University by advancing knowledge of plant pathology through creative research and scholarship, by extending that knowledge worldwide through the training of graduate students, and by applying the knowledge to protect the quality and quantity of the local and global food supply.The courses offered in this department are designed both to train students expecting to make plant pathology their professional field of specialization and to provide supplementary training for students in other biological and agricultural fields, particularly botany, crop science, genetics, horticulture, forestry, and entomology. Students who expect to become professional plant pathologists are advised to include in their undergraduate studies fundamental courses in botany, chemistry, genetics, microbiology, physics, and zoology.Preparation for Graduate StudyAs preparation for work toward an advanced degree, a student should have completed a bachelor's degree; at least one semester each of general inorganic chemistry, botany, zoology, physics; one semester each of systematic botany, plant physiology, general plant pathology, entomology, microbiology, precalculus, organic chemistry, genetics, and report writing or advanced composition.

Degree Description

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Training and Professional Development Opportunities

Students will gain analytical and practical skills in carrying out field-, laboratory- and greenhouse-based research that prepare them to be competitive for employment in academic, government and industry laboratories. Students will be provided other professional development opportunities such as resume writing, interview skills, written and oral communication skills, public speaking and attendance at professional conferences.

Contact Information

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PL P

511 Viruses and Virus Diseases of Plants 4 (3-3) Prereq course in biochemistry or advanced genetics. Nature of plant viruses, vector-virus relationships and virus diseases of plants.

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514 Phytobacteriology 4 (3-3) Prereq MBioS 303; MBioS 305. Isolation and characterization of bacteria having a saprophytic, symbiotic or pathogenic association with plants, molecular structure, function, and genetics.

515 Seminar 1 May be repeated for credit.

521 General Mycology 4 (2-6) The structure, life histories, classification, and economic importance of the fungi.

525 Field Plant Pathology and Mycology V 1 (0-3) to 2 (0-6) May be repeated for credit; cumulative maximum 4 hours. Field trips, forays, and demonstrations dealing with various aspects of plant pathology and mycology.

526 Advanced Fungal Biology 4 (2-6) Prereq Pl P 421, 521 and graduate standing. Advanced topics in fungal biology, ecology, systematics, evolution and coevolution via discussions of literature and special laboratory projects.

535 Molecular Genetics of Plant and Pathogen Interactions 3 Prereq MBioS 301, 303. Genetic and molecular biological aspects of host-pathogen interactions.

551 Epidemiology and Management of Plant Diseases 3 Prereq Pl P 429 or 529. Principles of plant disease epidemiology, control and ecology of pathogens.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Political Science

Degree offered: Doctor of Philosophy (Political Science)

Faculty working with graduate students: 22

Graduate students: 31

Graduate students receiving assistantships or scholarships: 45%

Program offered: DDP, Pullman, Vancouver

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal), TOEFL

Deadline: Fall: January 10
Spring: July 1

Program Description

Fifteen faculty members teach and conduct research in the major subfields of the discipline: American, comparative, international relations, public policy and administration, political theory, and political methodology, with sub-specializations in public law, American political behavior, political psychology, French and European politics, American foreign policy, gender and politics, the presidency, the Congress, environmental policy, state and local politics, and qualitative methodology.

Degree Description

Fifteen faculty members teach and conduct research in the major subfields of the discipline: American, comparative, international relations, public policy and administration, political theory, and political methodology, with sub-specializations in public law, American political behavior, political psychology, French and European politics, American foreign policy, gender and politics, the presidency, the Congress, environmental policy, state and local politics, and qualitative methodology.

Training and Professional Development Opportunities

None at WSU

Post-Graduate Employment Opportunities

Academic career at research university or teaching college, research thinktanks, non-profit organizations, corporations, and governmental careers.

Post-Graduate Career Placements

Academic jobs at various Research I universities, as well as ones at smaller liberal arts colleges.Government analytic and policy making jobs (defense and intelligence community).Work for profit and non-profit organizations.

Contact Information

Thomas Preston
Professor
Political Science
810 Johnson Tower
Pullman, WA 99164-4880
Telephone: 509-335-5225
Fax: 509-335-7990
E-mail: tpreston@wsu.edu

Faculty

Andrew Appleton, Dana Baker, William Budd, Aaron Bunch, Joseph Campbell, Cornell Clayton, Martha Cottam, Christopher Faricy, William Kabasenche, Carolyn Long, Nicholas Lovrich, Amy Mazur, Michael Myers, David Nice, John Preston, Travis Ridout, David Shier, Steven Stehr, Mark Stephan, Matt Stichter, Paul Thiers and Matthew Weidenfeld.

POL S

501 The Scope of Political Science 3 Prereq 12 hours Pol S. Historical development and present status of the discipline; contemporary issues and future trends.

502 Seminar in Normative Theory 3 Elements of normative theory developments; examination of bases of controversies and approaches in the modern literature using historical sources.

503 Research Methods in Political Science and Criminal Justice 3 Prereq 12 hours Pol S; Soc 321. Social science research design topics, measurement, sampling, data sources, experimental and quasi-experimental designs, field and historical designs, content analytic designs.

504 Quantitative Methods in Political Science and Criminal Justice 3 Prereq introductory statistics course. Applied statistical skills, enabling understanding of substantive political and social questions.

505 Comparative Criminal Justice Systems 3 Same as Crm J 505.

510 Seminar on American Institutions and Processes 3 Seminar required of all graduate students using this field as a major or a minor; it is a prerequisite of all other graduate seminars in the field.

511 Seminar in American Political Thought 3 May be repeated for credit; cumulative maximum 6 hours. The genesis and development of political thought in the United States.

512 Seminar in American Institutions 3 May be repeated for credit; cumulative maximum 6 hours. Origin, development, and contemporary issues in political organization and structure in the United States.

513 Seminar in American Political Behavior 3 May be repeated for credit; cumulative maximum 6 hours. Theoretical approaches to, and empirical analysis of, mass political behavior in the US.

514 Seminar in Public Policy 3 Examination of central questions in public policy including the nature of public policy, policy analysis, and government intervention in society.

516 Seminar on Law, Courts, and Judicial Politics 3 Prereq graduate standing. Seminar on law, courts, and judicial politics.

530 American Foreign Policy: Theories and Applications 3 Theories of international politics applied to American foreign policy.

531 Seminar in International Security 3 International security and arms control politics, negotiations, agreements.

532 Seminar in International Political Economy 3 Institutions, politics, and decision-making processes in managing international economic relations.

533 Topics in Political Psychology 3 May be repeated for credit; cumulative maximum 6 hours. Psychological influences on political decision making, bargaining, conflict and conflict resolution options.

534 Seminar in Comparative Politics 3

536 Special Topics in Comparative Politics 3 May be repeated for credit; cumulative maximum 6 hours. Advanced issues seminar in international and comparative politics.

537 Concepts and Methods in Comparative Politics 3 May be repeated for credit; cumulative maximum 6 hours. Selected concepts (state, political participation), and methods (cross-national analysis, case study approaches) in comparative politics.

538 International Development and Human Resources 3 Same as Anth 519.

539 The Political Science Profession 1 Methods, problems, and purposes of teaching, research, and vocation in political science.

540 Proseminar in Public Administration 3 Proseminar over viewing basic theories of administrative organization, relationships, and behavior.

541 Seminar in Evaluation Research 3 Same as Crm J 540.

542 Proseminar in Administration, Justice, and Applied Policy Studies 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Pol S 340 or 445. Analytical perspectives and theoretical issues.

543 Topics in Public Administration and Policy 3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing. Examination of the literature on the politics of the American public policy process.

544 The Politics of Policy Process 3 American political process; policy making under the constraints of a democratic system; relationship to the (non) achievement of the public interest.

547 Seminar in Public Administration 3

597 Graduate Internship V 2 (0-6) to 12 (0-36) May be repeated for credit; cumulative maximum 12 hours. Prereq graduate student. On/off campus internship in federal, state, or local government institutions; nonprofit or public organizations; written assignments and readings required.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Political Science

Degree offered: Master of Arts in Political Science - Non Thesis

Faculty working with graduate students: 7

Graduate students: 6

Deadline: Fall: January 10
Spring: July 1

Program Description

Fifteen faculty members teach and conduct research in the major subfields of the discipline: American, comparative, international relations, public policy and administration, political theory, and political methodology, with sub-specializations in public law, American political behavior, political psychology, French and European politics, American foreign policy, gender and politics, the presidency, the Congress, environmental policy, state and local politics, and qualitative methodology.

Degree Description

Master of Arts in Political Science Non Thesis in conjunction with certificate program is a terminal degree program designed to provide students with a specialized qualification better suited for the pursuit of professional careers in federal, state, or local government. The GJSS program targets students intending to pursue largely non-academic, governmental careers as practitioners, whether it be in the field of homeland security, law enforcement, or as analysts within the U.S. intelligence or defense communities.

Training and Professional Development Opportunities

None at WSU

Post-Graduate Employment Opportunities

The GJSS program targets students intending to pursue largely non-academic, governmental careers as practitioners, whether it be in the field of homeland security, law enforcement, military service, or as analysts within the U.S. foreign, intelligence,or defense communities.

Post-Graduate Career Placements

Many have gone on to careers in US government agencies, the military, or decided to pursue doctoral studies.

Contact Information

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Faculty

David Brody, Martha Cottam, Faith Lutze, Otwin Marenin, John Preston, Steven Stehr and Bryan Vila.

CRM J

505 Comparative Criminal Justice 3 Comparative study of crime laws and criminal justice systems in selected foreign countries.

530 Criminal Justice: Process and Institutions 3 Processes of criminal justice in the context of the social, political, and economic environments.

570 The Police and Society 3 Community and selected social institutional factors as related to their influence on police systems.

572 Seminar in Comparative Policing 3 Study of the history, organization, and policies of policing systems in selected countries and of transnational policing.

591 Seminar in the Administration of Criminal Justice 3 May be repeated for credit; cumulative maximum 6 hours. Current issues, problems, and critical concerns within the field of administration of criminal justice.

592 Proseminar in Administration, Justice, and Applied Policy Studies 3 May be repeated for credit; cumulative maximum 6 hours. Same as Pol S 542.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

POL S

400 Political Science Issues 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Pol S 101. Current issues in political science.

424 **US National Security Policy** 3 Prereq Pol S 103. Substantive and theoretical research on issues relevant to formulation and requirements of post-Cold War, US national security and defense policy.

427 **United States Foreign Relations** 3 Ends and means in foreign policy; organization, management, control, and current policy issues.

428 **Issues in Political Psychology** 3 Prereq Pol S 101 or Psych 105; completion of one Tier I and three Tier II courses. Introduction to the ways in which psychological factors influence political phenomena.

429 **Special Topics in American Foreign and Defense Policy** 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Pol S 102 or 103. Current issues in foreign policy.

503 **Research Methods in Political Science and Criminal Justice** 3 Prereq 12 hours Pol S; Soc 321. Social science research design topics, measurement, sampling, data sources, experimental and quasi-experimental designs, field and historical designs, content analytic designs.

514 **Seminar in Public Policy** 3 Examination of central questions in public policy including the nature of public policy, policy analysis, and government intervention in society.

530 **American Foreign Policy: Theories and Applications** 3 Theories of international politics applied to American foreign policy.

531 **Seminar in International Security** 3 International security and arms control politics, negotiations, agreements.

533 **Topics in Political Psychology** 3 May be repeated for credit; cumulative maximum 6 hours. Psychological influences on political decision making, bargaining, conflict and conflict resolution options.

540 **Proseminar in Public Administration** 3 Proseminar over viewing basic theories of administrative organization, relationships, and behavior.

700 **Master's Research, Thesis, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 **Master's Special Problems, Directed Study, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 **Doctoral Research, Dissertation, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

Project Management - Cert in Project Management

Degree offered: Graduate Certificate in Project Management

Graduate students: 15

Program offered: DDP

Deadline: Fall: July 15 (January 10 international)
Spring: November 15 (July 1 international)
Summer: April 1 (Default international)

Requirements

Students will apply for graduation with this certificate according to posted Graduate School Deadlines.

Program Description

The ETM Certificate Program allows students to complete shorter professional blocks of coursework relevant to their specific needs. Rather than completing all the course requirements for an ETM master's degree, students may take four courses (12-credit hours) in specialized areas. A certificate is awarded upon completion of these courses. Course credits earned for a certificate may also apply to a master's degree in the ETM Program or other graduate degree programs. A student may earn more than one certificate and may work on the certificate and master's program concurrently. Eight certificates are available in the Master of Engineering and Technology Management degree program.

Degree Description

It is necessary for project managers to update their skills in modern project management techniques, to effectively contribute to the continuing growth of the industry. The increasing complexity of project management requires the one in charge to understand the many facets in order to become/remain proficient in the field. The PM certificate provides the recipients with the skills to manage any type of project. It is a fact that all technology managers will have to also manage projects. It is necessary that these projects be managed professionally Many professionals have reported that this certificate has allowed them advance in their Careers as a Project Manager and as a Technology Manager.

Contact Information

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Faculty
Engineering and Technology Management
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Engineering Management

E M

501 **Management of Organizations** 3 Exploration of issues related to individual behavior in work organizations, including motivation, leadership, team-building, and team management skills.

508 **Legal Concepts for Engineering and Technical Managers** 3 Prereq graduate standing. Basic legal obligations of engineering/technical managers; identify, minimize and recognize risks and liability; contemporary legal environment and business law.

520 **Construction Project Management** 3 Prereq graduate standing. Construction project bids, proposals, contracts, project delivery/organization; estimating, scheduling, resource loading, project monitoring and controls, safety and quality

564 **Project Management** 3 Planning, organizing, scheduling and controlling major projects; human dimensions, PERT and CPM scheduling models, resource allocation, and cost controls. Credit not granted for both E M 464 and 564.

565 **Introduction to Systems Management** 3 Prereq graduate standing. Design manufacture, operation of complex system development for engineering managers; project planning, organizing, and controlling tools for engineering system constraints.

Protein Biotechnology - Cert in Protein Biotechnology

Degree offered: Graduate Certificate in Protein Biotechnology

Requirements

Please see the program/department for more information.

Psychiatric Mental Nurse Practitioner - Cert in Psych Mental Nurse Prac

Degree offered: Graduate Certificate in Psychiatric Mental Nurse Practitioner

Graduate students: 30

Graduate students receiving assistantships or scholarships: 16%

Program offered: Pullman, Spokane, Tri-Cities, Vancouver

Tests required: TOEFL, TOEFLI

Deadline: Fall: February 1
Spring: October 1

Requirements

A personalized program of study is developed at the time of acceptance into the program. Certificate requirements are individualized based on prior MN education. At this point, only prior WSU credits meet the requirements of this certificate program.

Program Description

The masters program in nursing at the College of Nursing is accredited by the Commission on Collegiate Nursing Education. The program builds upon an undergraduate degree in nursing and provides a basis for further study at the doctoral level. The purpose is to prepare students for leadership positions in advanced nursing practice.

Degree Description

Students with a master's degree in nursing with specialization in another field are eligible for review to complete courses specific to the Psychiatric/Mental Health Nurse practitioner program and receive a certificate of completion.

Training and Professional Development Opportunities

Some opportunity for teaching and research assistantships exist as well as clinical internships and international medical work.

Post-Graduate Employment Opportunities

Teaching at colleges of nursing, private practice PMHNP, mental health clinics

Post-Graduate Career Placements

Mental health clinics, teaching at colleges of nursing

Contact Information

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NURS

503 Scientific Inquiry in Nursing 2 Prereq graduate standing in nursing or permission of the instructor. Scientific inquiry applied to theoretical and philosophical foundations in nursing.

504 Methods of Nursing Research 3 Prereq Nurs 503 or c//. Research process as foundational to both conduct of scientific inquiry and utilization of findings.

507 Health Care Policy Analysis V 2-3 Prereq graduate standing. Analysis of health care system policy; exploration of issues of clinical management and community resource utilization including advocacy techniques.

525 Psychopharmacology 3 Prereq graduate standing in nursing. Clinical psychopharmacology across the lifespan including pharmacokinetics, pharmacodynamics, principles of prescribing, client education and outcome monitoring.

541 Advanced Family Psychiatric/Mental Health Practitioner: Child, Adult, and Geriatric Therapies 4 (3-3) Prereq graduate standing in nursing; Nurs 562; 581 or c//. Advanced study of theories of psychopathology and appropriate nursing interventions with individuals across the lifespan. Practicum emphasis: assessment, diagnosis, counseling.

543 Advanced Family Psychiatric Mental Health Nurse Practitioner: Group Psychotherapy Across the Livespan 4 (3-3) Prereq Nurs 541; Nurs 581. Introduction to theory and practice of group and family psychotherapy through the life span; Milieu, Cognitive Behavioral, Interpersonal, other theories.

546 Practicum in Psychiatric/Mental Health Nursing V 4 (1-9) to 5 (1-12) Prereq Nurs 541, 543, 562, 581; PharP 525 or c//. Individualized clinical experience/seminar designed to provide advanced competency, accountability, leadership in psychiatric/mental health nursing.

548 Psychiatric Nurse Practitioner Internship V 1-9 May be repeated for credit; cumulative maximum 9 hours. Prereq Nurs 546, PharP525, by interview only. Application and integration of theory, research findings, and interventions in the primary care of clients with psychiatric disorders.

549 Advanced Family Psychiatric Mental Health Nurse Practitioner: Group Psychotherapy Across the Livespan 2 Prereq Graduate standing in nursing or permission of instructor. Overview of the theories, physiology, course and epidemiology of addictions; assessment, evaluation, prevention and treatment.

562 Advanced Health Assessment and Differential Diagnoses 4 (3-3) Prereq graduate standing in nursing. Advanced holistic health assessment/differential diagnosis; analysis of data from biological, sociological, psychological, cultural, and spiritual dimensions.

581 Advanced Pathophysiology 4 Prereq graduate standing in nursing or permission of instructor. Advanced cellular and system pathophysiology of individuals with neurological, endocrine, immune, hematolgoy, cardiopulmonary, renal, gastrointestinal, bone and skin disorders.

598 Advanced Topics in Nursing V 1-3 May be repeated for credit; cumulative maximum 6 hours. May be repeated for credit; cumulative maximum 6 hours.

Psychology - Psychology-Clinical

Degree offered: Doctor of Philosophy (Psychology)

Faculty working with graduate students: 30

Graduate students: 26

Graduate students receiving assistantships or scholarships: 96%

Tests required: GRE (Combined)

Deadline: Fall: December 15
Spring: No spring applications

Program Description

The Department of Psychology offers Ph.D.

programs in Clinical Psychology and Experimental Psychology.

Degree Description

The Clinical Psychology Program at Washington State University is based on the scientist-practitioner model of training. The Program is designed to integrate theory, research, and clinical practice in the training of students. Students are thus involved in research activities each semester in the Program and clinical practica beginning in the third semester until the start of the 12-month internship. The goal of the program is to train highly competent clinical psychologists who will obtain high quality APA-approved internships and, with graduation, make positive contributions to the field of clinical psychology. Given that our graduates can potentially make contributions to clinical psychology in academic, research, medical, clinical, or community settings dependent on their interests and goals, the Program provides broad, general clinical training during the four years that students are at the University. Areas of interest within the Clinical Psychology Program include: Health Psychology, Neuropsychology, Adult Psychopathology, and Clinical Child, Adolescent and Family Psychology. The Program is fully accredited by the American Psychological Association [750 First Street, NE, Washington, DC 20002; (202) 336-5979].

Training and Professional Development Opportunities

RESEARCH TRAININGThe Clinical Program operates on the proposition that research training is an integral part of the education of clinical psychologists. Although the program admits only persons who expect to receive a Ph.D., each student who enters at the bachelor's degree level is expected to complete an empirical master's project while in progress toward the doctoral dissertation. Students may conduct research under the supervision of either clinical or experimental faculty. In addition to the master's project and dissertation, clinical students are expected to be involved in research activity under the direction of a faculty member during each semester in residence. CLINICAL TRAINING Exposure to professional clinical activities begins in the fall semester of the second year of graduate training and continues through the completion of the clinical internship. To provide broad clinical training for students, the Department of Psychology offers a variety of different clinical experiences. The Psychology Clinic in the Department of Psychology is staffed by faculty and clinical graduate students and provides assessment, diagnostic, and psychotherapy services for a fee to the University and surrounding communities. The University Counseling Services is staffed by clinical and counseling psychology graduate students and faculty psychologists, and provides ongoing counseling and emergency services to students. The University Health and Wellness Services provide assistance to students through the Behavior Medicine Service, which is staffed by clinical graduate students, physicians, and a psychiatrist. The University of Idaho Child and Adolescent Study Center provides assessment and therapy to children and adolescents.

Post-Graduate Employment Opportunities

Post-Graduate Employment Opportunties 1. Post-doctoral (one to two year) positions in universities and medical schools 2. Staff psychologist positions in VA Health Care Centers 3. Faculty positions as clinical psychologists at Universities 4. Staff psychologist positions in hospitals and clinics 5. Staff psychologist positions in medical schools 6. Clinical psychologist in private practice

Post-Graduate Career Placements

2011 Graduates1. Onondaga Case Management Services Syracuse, NY2. Northern California Health Care System Sacramento, CA3. Department of Pediatric Psychology University of Arkansas for Medical Sciences Little Rock, AR4. Private Practice Littleton, CO2010 Graduates1. Health and Wellness Washington State University Pullman, WA2. Mayo Clinic, Rochester, MN3. The Help Group Sherman Oaks, CA 914014. Department of Psychology Washington State University Pullman, WA5. Brooke Army Medical Center Warrior Resiliency Program Department of Behavioral Medicine 3851 Roger Brooke Drive Fort Sam Houston, TX 6. University of Alaska-Anchorage Center for Behavioral Health Studies Anchorage, AK 7. Department of Neurology University of California-Davis Sacramento, CA 958178. Veterans Affairs Medical Center Salem, Virginia 241539. VA Palo Alto Health Care System Palo Alto, CA 943042009 Graduates1. Trillium Health Center Mississauga, Ontario2. Department of Psychiatry and Division of Neurology University of British Columbia Vancouver, BC 3. James A. Haley Veterans Hospital Tampa, Florida4. Department of Physical Medicine and Rehabilitation Johns Hopkins University School of Medicine Baltimore, Maryland2008 Graduates1. Department of Psychology Northern Illinois University DeKalb, IL2. Evergreen Behavioral Health Vancouver, WA3. Puget Sound Psychology and Consulting Seattle, WA4. St. Peter Regional Treatment Center St. Peter, MN5. Platteville Family Resource Center Platteville, WI2007 Graduates1. Alcohol Drug Abuse and Treatment Program Cannon Air Force Base New Mexico2. Merit Care Health System Detroit Lakes, MN3. VA Loma Linda Healthcare System, Loma Linda, California4. Department of Psychiatry University of Washington School of Medicine Seattle, WA 5. Private Practice in Forensic Psychology Seattle, WA6. Zablocki VA Medical Center Milwaukee, WI2006 Graduates1. Department of Veterans Affairs St. Augustine, FL2. Foothills Medical Center-Sleep Center Alberta Health Services Alberta, Canada3. Portland VA Medical Center Portland, OR4. Fargo VA Medical Center Fargo, ND5. Department of Rehabilitative Medicine St. Mary's Hospital Tucson, Arizona6. Assistant Dean of Students for Chemical Health and Outreach Programing Counseling Services St. Cloud State University St. Cloud, Wisconsin7. Easton Center for Alzheimer's Disease Research UCLA David Geffen School of Medicine Los Angeles, CA8. Department of Psychiatry/Psychology Division David Geffen School of Medicine UCLA Los Angles, CA

Contact Information

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Human Development

H D

511 Theory and Substance of Human Development I 3 Prereq graduate standing. Human development theories; application to life span development, cultural variations, resources, problem solving, interaction of families and individuals with other systems.

Human Development

PSYCH

502 Research Design V 1 (0-3) to 3 (0-9) May be repeated for credit; cumulative maximum 16 hours. Research design, equipment, data collection, data analysis, and report writing.

504 History of Psychology: Theoretical and Scientific Foundations 3 Roots of scientific explanation in psychology traced through various philosophical schools and psychological movements.

505 Teaching Introductory Psychology V 1-3 May be repeated for credit; cumulative maximum 4 hours. Prereq graduate standing. Problems and techniques related to teaching introductory psychology.

506 Current Research in Psychology 1 May be repeated for credit; cumulative maximum 2 hours. Current research being conducted by psychology faculty and members of associated departments.

511 Analysis of Variance and Experimental Design 4 Prereq Psych 311 or statistics course. Parametric, nonparametric, repeated-measures, and multivariate ANOVA; planned comparisons; confidence intervals and power analysis; experimental design and variants.

512 Correlation, Regression, and Quasi-Experimental Design 3 Prereq Psych 511. Simple and multiple correlation and regression; time-series analysis; factor analysis; field research and quasi-experimental design.

514 Psychometrics 3 Prereq Psych 512. Scientific construction of behavioral assessment instruments, including validation and reliability; types of scales and responses; statistical scaling; test theory issues.

515 Multilevel and Synthesized Data 3 Prereq Psych 512. Structural equation modeling, hierarchical linear modeling and meta-analysis and the software used to conduct these analyses.

516 Applied Structural Equation Modeling with Current Software 3 Prereq Psych 511; Psych 512; Psych 514; Psych 515. Confirmatory factor analysis, path analysis, structural regression analysis, multilevel analysis and latent growth analysis with current software.

520 Empirical Approaches to Psychotherapy 3 Prereq Psych 533. Major therapy systems, research on process and outcome of therapy.

530 Professional, Ethical, and Legal Issues 3 Application of professional, ethical, and legal issues in clinical psychology to such topics as confidentiality, dual-relationships, research, assessment, and intervention.

533 Adult Psychopathology 3 Prereq by interview only. Theoretical and empirical approaches to diagnosis, etiology and treatment of mental disorders.

534 Clinical Psychopharmacology 3 Prereq Psych 533. Classification, clinical application, and mechanisms of psychotherapeutic drugs used in the treatment of mental disorders.

535 Clinical Assessment and Diagnosis 3 Diagnostic interviewing, conceptualization of clinical problems, case presentations, and treatment planning.

536 Measurement Theory and Personality Assessment 3 Prereq by interview only. Psychometric theory, theories of personality, objective and projective methods of assessing personality, development of testing and interpretive skills.

539 Measurement Theory, Intellectual and Personality Assessment 3 Prereq by interview only. Psychometric theory, theories of intelligence, methods of appraising intelligence in children and adults, and development of testing and interpretive skills.

543 Child Clinical Psychology: Empirical Approaches to Assessment and Therapy 3 Research on developmental psychopathology, child assessment, and child therapy.

544 Medical Psychology: Psychological and Pharmacological Interventions 3 Psychological factors and their influence upon the causes and/or course of medical illnesses as well as relevant clinical interventions.

545 Psychology Clinic Adult Therapy Practicum 3 (0-9) May be repeated for credit; cumulative maximum 18 hours. Prereq by interview only. Supervised practice in the clinical application of psychology with adults in the Psychology Clinic.

546 Counseling Service Practicum V 1 (0-3) to 3 (0-9) May be repeated for credit; cumulative maximum 12 hours. Prereq Psych 545 or c//. By interview only. Supervised practice in the clinical application of psychology at the WSU Counseling Service.

547 Medical Psychology Practicum 3 May be repeated for credit; cumulative maximum 18 hours. Prereq by interview only. Supervised practice in the clinical application of psychology at the WSU Health and Wellness Service.

548 Clinical Externship V 1-3 May be repeated for credit; cumulative maximum 18 hours. Prereq by interview only. Supervised practice in the clinical application of psychology at approved hospitals and medical practices.

550 Attitudes and Social Cognition 3 Attitude structure, function, and change; social cognition and motivation, and attributions.

552 Diversity Issues in Psychology 3 Research, theories, and controversies regarding the role of human diversity in psychotherapy, psychological assessment, and clinical research.

574 Physiological Psychology 3 Neuroanatomical, neurochemical, and other biological cases of human and animal behavior.

575 Foundations of Neuropsychology 3 Foundations in brain/behavior relationships and neuropathological syndromes; preparation for advanced training in neuropsychological assessment.

592 Cognition and Memory 3 Experimental approaches to human information processing, memory, and cognition.

595 Clinical Internship in Psychology V 2 (0-6) to 16 (0-48) May be repeated for credit; cumulative maximum 16 hours. Prereq passing of preliminary exams and completion of course work for PhD. Clinical training in an internship approved by American Psychological Association or by WSU.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Psychology - Psychology-Experimental

Degree offered: Doctor of Philosophy (Psychology)

Faculty working with graduate students: 33

Graduate students: 29

Graduate students receiving assistantships or scholarships: 93%

Program offered: Pullman, Vancouver

Tests required: GRE (Combined)

Deadline: Fall: December 15

Requirements

A master's-level research project is also required for those students who enter without a master's.

Program Description

The Department of Psychology offers Ph.D. programs in Clinical Psychology and Experimental Psychology.

Degree Description

The doctoral program in Experimental Psychology at Washington State University is designed to produce highly skilled experimental psychologists. Degree recipients are expected to be highly knowledgeable about their specialty areas, to have a strong background in general psychology, to be able to identify significant research problems, and to be conversant with a wide variety of strategies for generating and testing hypotheses that emerge from these problems. It is expected that each graduate will leave Washington State University well equipped to become a productive member of the scientific community. The program is designed to be completed in no more than 5 years, for students entering without a master's degree.

Training and Professional Development Opportunities

varies by specific research area

Post-Graduate Employment Opportunities

psychology researcher; statistician; college professor; consultant

Post-Graduate Career Placements

College Professorships: MacMurray College, SE Oklahoma State University, Augustana College, University of Great Falls, D'Youville College, Zayed University (Dubai), Western WA University, Idaho State University, North Dakota State University, Ohio University, University of Alaska, Western Illinois University, Indiana University (PA), Santiago Canyon College, Wheaton College, Concordia College; University of Wisconsin-Stout, Singapore Management University; Merced College; Post-Doctoral Research Associateships: Cornell Medical School, Columbia University, American Psychological Association, Vanderbilt University, University of British Columbia; Researcher/Statistician: WSU-Spokane, Federal Aviation Administration, U.S. Air Force, other private companies.

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Faculty

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MGTOP

587 Professional Ethics and Practice in Business 3 Prereq MgtOp 451 or 591. Ethical issues faced by businesses in the current environment; traditional sources for discerning professional and ethical practices.

593 Managerial Leadership and Productivity 3 Prereq enrollment in the MBA program. Organizational behavior and human motivation in the workplace; organization and leadership theories, studies, projects and models leading to improved productivity.

NEURO

509 Affective Neuroscience 3 Prereq graduate standing. Graduate-level counterpart of Neuro 409; additional requirements. Credit not granted for both Neuro 409 and 509.

540 Special Topics in Integrative Neuroscience 3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing. Concepts and controversies in neuroscience involving integrative properties of cell systems. May be repeated for credit; cumulative maximum 6 hours.

541 Special Topics in Cellular and Molecular Neuroscience 3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing. Concepts and controversies in neuroscience that involve nerve cell function and regulation. May be repeated; cumulative maximum 6 hours.

542 Special Topics in Disciplinary Neuroscience 3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing. Concepts and controversies in neuroscience that revolve around traditional approaches to nervous system study. May be repeated; cumulative maximum 6 hours.

543 Special Topics in Behavioral/Clinical Neuroscience 3 May be repeated for credit; cumulative maximum 6 hours. Concepts and controversies in neuroscience that involve normal and pathological aspects of behavior.

PHIL

504 Special Topics in Philosophy 3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing. Intensive study of a special topic not otherwise covered in depth in the curriculum.

530 Bioethics 2 Prereq graduate standing. Professional ethics for scientists; ethical implications of new technologies; obligations to human and non-human research subjects.

POL S

533 Topics in Political Psychology 3 May be repeated for credit; cumulative maximum 6 hours. Psychological influences on political decision making, bargaining, conflict and conflict resolution options.

PSYCH

504 History of Psychology: Theoretical and Scientific Foundations 3 Roots of scientific explanation in psychology traced through various philosophical schools and psychological movements.

505 Teaching Introductory Psychology V 1-3 May be repeated for credit; cumulative maximum 4 hours. Prereq graduate standing. Problems and techniques related to teaching introductory psychology.

506 Current Research in Psychology 1 May be repeated for credit; cumulative maximum 2 hours. Current research being conducted by psychology faculty and members of associated departments.

508 Special Topics in Psychology V 1-3 May be repeated for credit.

511 Analysis of Variance and Experimental Design 4 Prereq Psych 311 or statistics course. Parametric, nonparametric, repeated-measures, and multivariate ANOVA; planned comparisons; confidence intervals and power analysis; experimental design and variants.

512 Correlation, Regression, and Quasi-Experimental Design 3 Prereq Psych 511. Simple and multiple correlation and regression; time-series analysis; factor analysis; field research and quasi-experimental design.

513 Seminar in Quantitative Methods and Research Design 3 May be repeated for credit. Prereq Psych 512. Advanced topics in specialized quantitative procedures and in design of research in psychology.

514 Psychometrics 3 Prereq Psych 512. Scientific construction of behavioral assessment instruments, including validation and reliability; types of scales and responses; statistical scaling; test theory issues.

515 Multilevel and Synthesized Data 3 Prereq Psych 512. Structural equation modeling, hierarchical linear modeling and meta-analysis and the software used to conduct these analyses.

516 Applied Structural Equation Modeling with Current Software 3 Prereq Psych 511; Psych 512; Psych 514; Psych 515. Confirmatory factor analysis, path analysis, structural regression analysis, multilevel analysis and latent growth analysis with current software.

519 Industrial/Organizational Psychology 3 Application of psychological principles to the study of work behavior; includes topics such as personnel selection, performance appraisal, training, work motivation, teams, leadership, and job attitudes.

533 Adult Psychopathology 3 Prereq by interview only. Theoretical and empirical approaches to diagnosis, etiology and treatment of mental disorders.

534 Clinical Psychopharmacology 3 Prereq Psych 533. Classification, clinical application, and mechanisms of psychotherapeutic drugs used in the treatment of mental disorders.

544 Medical Psychology: Psychological and Pharmacological Interventions 3 Psychological factors and their influence upon the causes and/or course of medical illnesses as well as relevant clinical interventions.

550 Attitudes and Social Cognition 3 Attitude structure, function, and change; social cognition and motivation, and attributions.

574 Physiological Psychology 3 Neuroanatomical, neurochemical, and other biological cases of human and animal behavior.

575 Foundations of Neuropsychology 3 Foundations in brain/behavior relationships and neuropathological syndromes; preparation for advanced training in neuropsychological assessment.

577 Behavioral Pharmacology 3 Prereq Psych 574 or graduate standing in Neuro or P/T. Survey of drugs which affect brain function with emphasis on animal models and clinical applications.

592 Cognition and Memory 3 Experimental approaches to human information processing, memory, and cognition.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Public Affairs

Degree offered: Master of Public Affairs

Faculty working with graduate students: 13

Graduate students: 39

Graduate students receiving assistantships or scholarships: 7%

Program offered: Vancouver

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal)

Deadline: Fall: January 10
Spring: July 1

Requirements

Transfer credits are not accepted for core courses. Students are expected to submit their program of study in the last semester of coursework. Applicants and students should consult the current MPA Handbook for complete information. Applicants and students should consult the current MPA Handbook for complete information.

Degree Description

The Master's Degree in Public Affairs (MPA), which is housed in the Department of Political Science, draws on a wide variety of academic disciplines, including political science, sociology, business administration, economics, health policy administration, environmental and research science/regional planning and criminal justice. This degree program is designed for the education of individuals interested in administrative and leadership positions in the public sector.The MPA prepares students for a diverse group of positions in government such as public policy, personnel administration and strategic planning, as well as a range of jobs outside of government service, such as not-for-profit organizations. MPA students may already be employed in these areas and are seeking this degree to advance professionally in the field; these students can expect to hone their skills and receive further training. Alternatively, the Master of Public Affairs degree is also appropriate for students who would like to shift their career tracks and obtain a position in the public and non-profit sector.The MPA seeks to develop the skills of present and future public administrators and policy analysts in the region to provide them with the tools to meet the challenges of government. In an age when governmental philosophies are continually being redefined, the MPA program is designed to promote professionalism, leadership, inventiveness, and a commitment to public service for government employees in the area of public administration, applied policy studies and health policy administration.The Master of Public Affairs degree at WSU is designed to accommodate the needs of working students. The degree can be completed entirely in the evenings, and most students often continue to work full time during the day when completing their degree. Seminars are small, ranging from 5-20 students, and typically meet one or two evenings a week over the course of the semester. Class structure includes lectures, small group discussions, and individual and group presentations. The program takes two or more years to complete; the exact length of time required to complete the degree depends on how many classes a student takes each semester.

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Faculty

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ANTH

405 Medical Anthropology 3 Prereq completion of one Tier I and three Tier II courses. Relationships among disease, curing, culture and environment; non-Western medical systems; political economy of health care.

CRM J

400 Issues in the Administration of Criminal Justice 3 May be repeated for credit; cumulative maximum 6 hours. Selected topics in criminal justice.

403 Violence Toward Women 3 Prereq completion of one Tier I and three Tier II courses. Violence toward women and its relationship to broader social issues such as sexism and social control.

405 Comparative Criminal Justice Systems 3 Comparative study of criminal justice systems in the US and selected foreign countries.

420 Criminal Procedure 3 Principal court decisions concerning standards of conduct and rights in the criminal process.

424 Community Corrections 3 Prereq Crm J 150. Theory practice and human impact of treating criminal offenders in the community.

426 Victimology and Public Policy 3 Examination of victimization; policy responses to victims; victim's rights.

427 Crime Prevention Strategies 3 Personal, environmental, community-based and government crime prevention strategies and issues.

428 Drug and Alcohol Use and Abuse 3 Drug use, impact on behavior and drug control policies.

450 Senior Seminar: Ethical Issues in Criminal Justice 3 Examination of ethical issues in decision making in criminal justice.

468 Addictive Behavior Across the Demographic Spectrum 3 Prereq Psych 105, Soc 101 or Crm J 101. Same as Soc 468.

490 Criminal Justice Internship V 2 (0-6) to 12 (0-36) May be repeated for credit; cumulative maximum 12 hours. On/off-campus internship in criminal justice institutions (police, FBI, jails, law firms, etc.); written assignments and readings will be required.

499 Special Problems V 1 (0-3) to 4 (0-12) May be repeated for credit.

503 Research Methods in Political Science and Criminal Justice 3 Same as Pol S 503.

504 Quantitative Methods in Political Science and Criminal Justice 3 Prereq introductory statistics course. Same as Pol S 504.

505 Comparative Criminal Justice 3 Comparative study of crime laws and criminal justice systems in selected foreign countries.

530 Criminal Justice: Process and Institutions 3 Processes of criminal justice in the context of the social, political, and economic environments.

540 Seminar in Evaluation Research 3 Interrelationship of ideology, data, policy development, and policy implementation in public policy analysis.

541 Seminar in Corrections 3 Prereq Stat course. Current issues related to the control, management, and sanctioning of criminal offenders.

555 Seminar in Criminological Theory 3 Prereq graduate standing. Individual, situational and ecological correlates of criminal behavior; data sources and empirical research.

560 Prosecution and Adjudication 3 Prereq graduate standing. The function of courts and the behavior of prosecutors, defense attorneys and judges within the criminal justice system.

570 The Police and Society 3 Community and selected social institutional factors as related to their influence on police systems.

572 Seminar in Comparative Policing 3 Study of the history, organization, and policies of policing systems in selected countries and of transnational policing.

580 Gender and Justice 3 Criminal justice system's treatment of women offenders, victims, and professionals.

591 Seminar in the Administration of Criminal Justice 3 May be repeated for credit; cumulative maximum 6 hours. Current issues, problems, and critical concerns within the field of administration of criminal justice.

592 Proseminar in Administration, Justice, and Applied Policy Studies 3 May be repeated for credit; cumulative maximum 6 hours. Same as Pol S 542.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Environmental Science & Regional Planning

ES/RP

481 Economics of Environmental Issues 3 Prereq Econ 101; Rec Econ 301. Same as Econ 481.

504 Ecosystem Management 3 Analysis of ecosystem processes; dual emphasis on ecological principles and development of methods and concepts to evaluate policies for management.

544 Environmental Assessment 4 Graduate-level counterpart of ES/RP 444; additional requirements. Credit not granted for both ES/RP 444 and 544.

586 ArcGIS and Geospatial Analysis 4 (2-6) Same as SoilS 568. Graduate-level counterpart of ES/RP 486; additional requirements. Credit not granted for both ES/RP 486 and 586.

Human Development

H D

580 Families, Community and Public Policy 3 Prereq H D 513, 514, or approved graduate research methods course. Analysis of family policy research; role of family policy research in public policy and knowledge building processes.

Health Policy And Administration

HPA

500 Introduction to the Health Care System 3 Orientation to history and organization of the health care system.

501 Health Care Policy and Politics 3 History, methods, results and evaluation of health-care-related policy and politics.

502 Law and Ethics of Health Management 3 Private health law and ethics, including professional liability, relationship of physician and patient, malpractice reform, health institutions, and health access.

515 Health Care Management 3 Introduction to the knowledge, skills, and values associated with the practice of health management.

572 Health Care Ethics 3 Ethical issues affecting health care institutions, professionals and consumers.

Health Policy And Administration

MGTOP

582 Personnel and Human Resource Management 3 Human resources and personnel administration; selection, training, compensation, performance appraisal, labor relations, health and safety, EEO legislation.

585 Negotiation Skills 3 Graduate counterpart of MgtOp 485; additional requirements. Credit not granted for both MgtOp 485 and 585.

590 Strategy Formulation and Organizational Design 3 Prereq enrollment in the MBA program. Relationship between the formulation of strategy and the selection of effective organizational structures and systems.

593 Managerial Leadership and Productivity 3 Prereq enrollment in the MBA program. Organizational behavior and human motivation in the workplace; organization and leadership theories, studies, projects and models leading to improved productivity.

Health Policy And Administration

NURS

507 Health Care Policy Analysis V 2-3 Prereq graduate standing. Analysis of health care system policy; exploration of issues of clinical management and community resource utilization including advocacy techniques.

577 Health Care Ethics V 2-3 Graduate-level counterpart of Nurs 477; additional requirements. Credit not granted for both Nurs 477 and 577.

Health Policy And Administration

POL S

400 Political Science Issues 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Pol S 101. Current issues in political science.

402 Civil Liberties 3 Prereq Pol S 101. Origin and development of civil liberties; responsibility of the branches of government and the people for their maintenance.

404 The Judicial Process 3 Prereq Pol S 101. Relationship of judicial behavior to structure, politics and the behavior of other participants in the judicial process.

405 Comparative Criminal Justice Systems 3 Same as Crm J 405.

410 History of American Indian Sovereignty and Federal Indian Law 3 Same as Hist 410.

416 Policy Analysis 3 Analysis of public policy formation, evaluation and implementation.

417 Voting and Elections 3 Analysis of voting behavior and elections; turnout, influences on voter choice, congressional and presidential elections, campaign finance, and polling.

418 Human Issues in International Development 3 Same as Anth 418.

420 Political Parties and Interest Groups 3 Roles, characteristics, and theories of political parties; organization, behavior, and impact of interest groups.

424 US National Security Policy 3 Prereq Pol S 103. Substantive and theoretical research on issues relevant to formulation and requirements of post-Cold War, US national security and defense policy.

427 United States Foreign Relations 3 Ends and means in foreign policy; organization, management, control, and current policy issues.

428 Issues in Political Psychology 3 Prereq Pol S 101 or Psych 105; completion of one Tier I and three Tier II courses. Introduction to the ways in which psychological factors influence political phenomena.

429 Special Topics in American Foreign and Defense Policy 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Pol S 102 or 103. Current issues in foreign policy.

430 The Politics of Natural Resource and Environmental Policy 3 Prereq completion of one Tier I and three Tier II courses. Issues and problems of natural resource and environmental policy.

432 Comparative Public Policy 3 Processes of public policy formation and outcomes in post-industrial democracies, and how to analyze it in a comparative perspective.

435 Politics of Developing Nations 3 Issues and problems of political development and modernization common among developing nations.

436 Disability, Aging, and Public Policy 3 Prereq Pol S 101. Application of disability and aging theory to public policy challenges in the 21st century.

437 Classical Political Thought 3 The development of political philosophy from the pre-Socratics to Machiavelli.

438 Recent Political Thought 3 The development of political thought since Machiavelli.

442 Leadership Skills for the Public Sector 3 Prereq Pol S 101 or 102; Psych 105 or Soc 101. Leadership, motivation, team-building, group dynamics, interpersonal and group conflict and job design for the public sector.

443 Administrative Jurisprudence 3 Study of the origins, nature, and practice of justice and law in public administration.

445 Public Personnel Administration 3 Development of American civil service systems and concepts; problems and techniques involved in selection and management of public employees.

446 Public Budgeting 3 The government budget as an instrument of politics, planning and control; organizing for democratic accountability.

447 Comparative Public Administration 3 Public administration systems in Europe, Japan, Socialist and developing countries; origins and development.

448 Urban Politics and Policy 3 Urban political processes and policies; intergovernmental relationships; impact of urban reform.

450 The Legislative Process 3 Role of legislatures in a democratic system; problems of representation; election and tenure of lawmakers; legislative organization and procedures.

455 The Presidency 3 Organization and processes of executive institutions at the national level; uses and limits of executive power.

472 European Politics 3 Government and politics of postindustrial societies, including West Europe and Japan.

474 African Politics 3 Prereq completion of one Tier I and three Tier II courses. Historical, economic, and social factors that shape contemporary African political systems and problems of nation-building.

475 Mao to Deng: The People's Republic of China, 1949 - 1999 3 Same as Hist 475.

476 Revolutionary China: 1800 to Present 3 Same as Hist 476.

497 Political Science Internship V 1 (0-3) to 12 (0-36) May be repeated for credit; cumulative maximum 12 hours. Prereq Pol S 101. On/off campus internship in federal, state, or local government institutions; nonprofit or public organizations; written assignments and readings required.

498 Cooperative Education Internship V 2 (0-6) to 12 (0-36) May be repeated for credit; cumulative maximum 12 hours. By interview only. Off-campus cooperative education internship with business, industry, or government unit coordinated through the Professional Experience Program.

499 Special Problems V 1 (0-3) to 4 (0-12) May be repeated for credit.

501 The Scope of Political Science 3 Prereq 12 hours Pol S. Historical development and present status of the discipline; contemporary issues and future trends.

502 Seminar in Normative Theory 3 Elements of normative theory developments; examination of bases of controversies and approaches in the modern literature using historical sources.

503 Research Methods in Political Science and Criminal Justice 3 Prereq 12 hours Pol S; Soc 321. Social science research design topics, measurement, sampling, data sources, experimental and quasi-experimental designs, field and historical designs, content analytic designs.

504 Quantitative Methods in Political Science and Criminal Justice 3 Prereq introductory statistics course. Applied statistical skills, enabling understanding of substantive political and social questions.

505 Comparative Criminal Justice Systems 3 Same as Crm J 505.

510 Seminar on American Institutions and Processes 3 Seminar required of all graduate students using this field as a major or a minor; it is a prerequisite of all other graduate seminars in the field.

511 Seminar in American Political Thought 3 May be repeated for credit; cumulative maximum 6 hours. The genesis and development of political thought in the United States.

512 Seminar in American Institutions 3 May be repeated for credit; cumulative maximum 6 hours. Origin, development, and contemporary issues in political organization and structure in the United States.

513 Seminar in American Political Behavior 3 May be repeated for credit; cumulative maximum 6 hours. Theoretical approaches to, and empirical analysis of, mass political behavior in the US.

514 Seminar in Public Policy 3 Examination of central questions in public policy including the nature of public policy, policy analysis, and government intervention in society.

516 Seminar on Law, Courts, and Judicial Politics 3 Prereq graduate standing. Seminar on law, courts, and judicial politics.

530 American Foreign Policy: Theories and Applications 3 Theories of international politics applied to American foreign policy.

531 Seminar in International Security 3 International security and arms control politics, negotiations, agreements.

532 Seminar in International Political Economy 3 Institutions, politics, and decision-making processes in managing international economic relations.

533 Topics in Political Psychology 3 May be repeated for credit; cumulative maximum 6 hours. Psychological influences on political decision making, bargaining, conflict and conflict resolution options.

534 Seminar in Comparative Politics 3

536 Special Topics in Comparative Politics 3 May be repeated for credit; cumulative maximum 6 hours. Advanced issues seminar in international and comparative politics.

537 Concepts and Methods in Comparative Politics 3 May be repeated for credit; cumulative maximum 6 hours. Selected concepts (state, political participation), and methods (cross-national analysis, case study approaches) in comparative politics.

538 International Development and Human Resources 3 Same as Anth 519.

539 The Political Science Profession 1 Methods, problems, and purposes of teaching, research, and vocation in political science.

540 Proseminar in Public Administration 3 Proseminar over viewing basic theories of administrative organization, relationships, and behavior.

541 Seminar in Evaluation Research 3 Same as Crm J 540.

542 Proseminar in Administration, Justice, and Applied Policy Studies 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Pol S 340 or 445. Analytical perspectives and theoretical issues.

543 Topics in Public Administration and Policy 3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing. Examination of the literature on the politics of the American public policy process.

544 The Politics of Policy Process 3 American political process; policy making under the constraints of a democratic system; relationship to the (non) achievement of the public interest.

547 Seminar in Public Administration 3

597 Graduate Internship V 2 (0-6) to 12 (0-36) May be repeated for credit; cumulative maximum 12 hours. Prereq graduate student. On/off campus internship in federal, state, or local government institutions; nonprofit or public organizations; written assignments and readings required.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Health Policy And Administration

SOC

532 Environmental Sociology 3 Societal-environmental interactions; impacts of human societies on the physical environment; environmental impacts on human behavior and social organization.

542 Social Stratification: Class, Race and Gender Inequalities 3 Theoretical and empirical research in both classic stratification literature and recent scholarship on class, race/ethnicity and gender.

580 Sociology of Race Relations 3 Analysis of race/ethnic relations; historical and current theoretical explanations of race/ethnic relations.

Reproductive Biology - Cert in Reproductive Biology

Degree offered: Graduate Certificate in Reproductive Biology

Requirements

Please see the program/department for more information.

Six Sigma Quality Management - Cert in Six Sigma Quality Mgmt

Degree offered: Graduate Certificate in Six Sigma Quality Management

Graduate students: 5

Program offered: DDP

Deadline: Fall: July 15 (January 10 international)
Spring: December 15 (July 1 international)
Summer: April 1 (Default international)

Requirements

Student must apply for the certificate and pay the required fee the first half of the final semester.

Program Description

The ETM Certificate Program allows students to complete shorter professional blocks of coursework relevant to their specific needs. Rather than completing all the course requirements for an ETM master's degree, students may take four courses (12-credit hours) in specialized areas. A certificate is awarded upon completion of these courses. Course credits earned for a certificate may also apply to a master's degree in the ETM Program or other graduate degree programs. A student may earn more than one certificate and may work on the certificate and master's program concurrently.

Degree Description

A concentration of quality improvement courses can be taken as a part of the engineering management masters degree or as a part of the Quality Management Certificate. The certificate provides training in Six Sigma principles relevant to strategic and operational decisions using state-of the art knowledge, tools, and skills in improving quality. This certificate is for engineers and non-engineering professionals in technology management holding a bachelor's degree in engineering, technical, or management areas.

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Engineering Management

E M

538 Lean Agility 3 3 Prereq graduate standing. Integration of the best of Lean, Six Sigma, and Theory of Constraints to accelerate the continuous improvement process.

560 Integrated Supply Chain Management 3 How technical managers analyze and manage the flow of materials, services, and information for products from inception to final customer.

570 Six Sigma Quality Management 3 Prereq graduate standing. Graduate-level counterpart of E M 470; additional requirements. Credit not granted for both E M 470 and 570.

580 Quality Control and Reliability 3 Prereq graduate standing; rec Stat 430. Graduate-level counterpart of E M 480; additional requirements. Credit not granted for both E M 480 and 580.

585 Quality Engineering Using Design of Experiments 3 Prereq graduate standing; Rec Stat 430. Graduate-level counterpart of E M 485; additional requirements. Credit not granted for both E M 485 and 585.

590 Design for Product and Service Realization 3 Prereq graduate standing. Same as E M 490; additional requirements. Credit not granted for both E M 490 and 590.

Engineering Management

STAT

430 Statistical Methods in Engineering 3 Prereq Math 172; 220. Random variables, sampling, hypothesis testing; linear, multilinear, and nonlinear regression; analysis of variance for designed experiments; statistical computing. Credit not normally granted for both Math 430 and 442.

Sociology

Degree offered: Doctor of Philosophy (Sociology)

Faculty working with graduate students: 18

Graduate students: 39

Graduate students receiving assistantships or scholarships: 100%

Tests required: GRE (Quantitative), GRE (Verbal), TOEFL, TOEFLI

Deadline: Fall: January 10

Requirements

No additional requirements.

Program Description

The Department of Sociology at Washington State University offers Masters and Ph.D. degrees in Sociology, although we admit students only into the Ph.D. program (i.e. we do not admit students seeking only a Master's degree). The department makes an effort to fund all qualified students with teaching or research assistantships. Faculty members are productive scholars and dedicated teachers, with research agendas spanning a variety of subfields. Specifically, our program focuses on the discipline's core debates and several fields of study, including crime and deviance, race and ethnicity, environmental sociology, social inequality, political sociology, gender, social institutions, the family, and social psychology. Faculty interests span the discipline, from studies focusing on the international political economy to the hands on study of communities -- with wide array of specialties represented.On a methodological front, students will learn to employ a wide range of methods. Our program's size and our setting allow students to become acquainted with and to collaborate with members of the faculty. Our department has a rich history in sociology and has produced many well-known and highly respected professional sociologists. If you have any questions, please don't hesitate to contact us. If you're considering graduate school, we'd like to learn more about your interests and have the opportunity to answer your questions.

Degree Description

The Sociology Program at Washington State is designed to integrate research and teaching in the training of students. Students have the opportunity for involvement in collaborative and independent research activities, facilitated by faculty led seminars and research programs. In addition to offering yearly teaching workshops for students who teach their own courses, students participate in a teaching seminar in their second year. The goal of the Program, and focus of graduate curriculum, is to train highly competent sociologists who will make constructive contributions to the field of sociology in academic, research, governmental, and community settings.

Training and Professional Development Opportunities

Opportunities include ability to work on federal grants with faculty members and develop your own courses.

Post-Graduate Employment Opportunities

Academic appointments at colleges and universities, research positions with government agencies or private research organizations.

Post-Graduate Career Placements

Research positions in the following organizations:Battelle Institute, the Bonneville Power Administration, the State of Washington, the State of Oregon, the State of Idaho, the U.S. Ninth District Court, the Bureau of Labor Statistics, and the General Accounting Office.Tenure-track positions in the following institutions: University of Akron American University University of Arkansas Arkansas State University Auburn University Bowling Green State University Brigham Young University University of California - Riverside California State University - Fullerton California State University - Sacramento Cleveland State University University of Colorado - Boulder University of Colorado - Denver University of Florida Florida International University George Mason University Harvard University Humboldt State University Idaho State University University of Idaho Iowa State University University of Massachusetts - Boston University of Memphis University of Miami Michigan State University Minnesota State University - Mankato University of Missouri - Columbia University of Nebraska - Lincoln University of Nevada - Las Vegas University of Nevada - Reno University of New Mexico New Mexico State University University of North Carolina - Greensboro North Carolina State University University of North Dakota North Dakota State University Northern Arizona University University of Northern Colorado Ohio University Oklahoma State University University of Oregon Oregon State University Portland State University Purdue University University of South Florida University of Southern California University of Tennessee University of Texas - Austin Texas A&M University Utah State University Virginia Polytechnic Institute & State University University of Wisconsin - Madison

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SOC

421 Quantitative Techniques in Sociology II 3 Probability theory, sampling distributions, random variables, matrix approaches to statistical techniques, calculus for statistics and computer applications.

510 Development of Social Theory 3 Examination of the foundations of social theory.

517 Seminar in Contemporary Sociological Theory 3 Recent developments in sociological theory, analysis, application and appraisal of specific theoretical systems.

519 International Development and Human Resources 3 Same as Anth 519.

520 Research Methods in Sociology 3 Methodology of social research at the professional level.

521 Regression Models 3 Prereq Soc 421. Simple and multiple regression, structural equation models, nonlinear applications, applications for discrete dependent variables.

522 Advanced Sociological Methodology 3 May be repeated for credit; cumulative maximum 12 hours. Prereq Soc 521. Scaling theory, sampling theory, experimental design, measurement of association, multivariate analysis, current methods and techniques.

523 Qualitative Methods Practicum 3 Prereq graduate standing. Introduction to qualitative research methods as used in social sciences; epistemological underpinnings and empirical techniques.

525 Practicum in Survey Research 3 Prereq Soc 520. Practical experience in design and implementation of telephone and mail surveys; participation in all aspects of conducting a survey.

530 Demography 3 Population studies; causes, effects, and measurement of changes in fertility, mortality, and migration; population estimation and projection.

531 Human Ecology 3 Ecosystem context of human life; change viewed ecologically; sociological use and misuse of ecological concepts; issues in theory and research.

532 Environmental Sociology 3 Societal-environmental interactions; impacts of human societies on the physical environment; environmental impacts on human behavior and social organization.

535 Technology and Society 3 Prereq graduate standing. Analysis of sociotechnical systems; effects of technology on society; the social shaping of technologies and their environmental impacts.

536 Special Topics in Environmental Sociology V 1 (0-3) to 3 (0-9) May be repeated for credit; cumulative maximum 9 hours. Special topics in environmental sociology.

542 Social Stratification: Class, Race and Gender Inequalities 3 Theoretical and empirical research in both classic stratification literature and recent scholarship on class, race/ethnicity and gender.

545 Sociology of Community 3 Community stability and change: interaction processes; decision making; societal linkages; effects on well-being.

553 Social Organization and the Family 3 The family as a social institution; principles of social organization applied to family relationships; macro-level analyses of family structure.

554 Social Psychology of the Family 3 The family as an interacting group; social psychological theories and research applied to family relationships; effects of families on individuals.

556 Sociology of Aging and the Life Course 3 Theory and research on the changes individuals undergo over the life course; influences of history, social structure, agency and social relations on lives.

580 Sociology of Race Relations 3 Analysis of race/ethnic relations; historical and current theoretical explanations of race/ethnic relations.

590 Special Topics in Sociology 3 May be repeated for credit; cumulative maximum 9 hours.

591 The Sociology Profession 1 May be repeated for credit; cumulative maximum 2 hours. Requirements, operations, problems, and possibilities of the sociology profession.

592 Special Topics in Sociology 3 May be repeated for credit; cumulative maximum 9 hours.

593 Special Topics in Sociology V 1-3 May be repeated for credit; cumulative maximum 6 hours. Special topics in sociology.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Soil Science

Degree offered: Doctor of Philosophy (Soil Science)

Faculty working with graduate students: 75

Graduate students: 29

Graduate students receiving assistantships or scholarships: 79%

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal), TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

Fifteen hours of 500-level grade coursework are required; not included but required are 2 credits of Soils 501 Seminar and 1 credit of Soils 502 State Tour. Two credits of Soils 511 Research Proposal and Development arealso required (S/F grading). No more than half of the graded credit may be transfer credit. Seventy-two credits are required for the degree.

Program Description

The Department of Crop and Soil Sciences at Washington State University department offers M.S. and Ph.D. programs in Soil Science, with the ability to conduct graduate research in a variety of specialized areas within each discipline. The Soil Science program supports two major, overlapping research themes: sustainable agriculture and vadose zone hydrology. Within these broad themes, faculty lead collaborative research on organic, conservation and precision agriculture, biogeochemistry, contaminant transport, storm water management, nutrient cycling, microbial dynamics, climate change mitigation, proximal soil sensing, digital soil mapping, and bioenergy development. Soils faculty work closely with crops and horticulture faculty and with the Center for Environmental Research, Education and Outreach to apply this expertise to sustainable natural and agricultural systems. We have several research projects conducted in cooperation with the United States Department of Agriculture (USDA) through the USDA Agricultural Research Service (USDA-ARS) and USDA Natural Resources Conservation Service (USDA-NRCS) in addition to research projects being conducted in association with other universities. Research facilities include state of the art laboratories and greenhouse facilities, and research farms located in Pullman, as well as throughout the state at five Research and Extension Centers. Graduate students learn valuable skills and knowledge working side by side with faculty members and research technicians providing them the opportunity to play an integral role in the advancement of their major advisor's research. Students also have the opportunity to gain leadership, communication, and instructional experience through the option of serving as teaching assistants for one or more courses within their discipline. Qualified students typically receive competitive teaching or research assistantships. These assistantships provide non-resident and resident tuition waivers, paid health insurance, and stipends to help cover living expenses.

Degree Description

Training and Professional Development Opportunities

Students have the opportunity to gain leadership, communication, and instructional experience through the option of serving as teaching assistants for one or more courses within their discipline. Extension program delivery, and Graduate School teacher training and grant proposal writing workshop opportunities are also available.

Post-Graduate Employment Opportunities

Soil scientists with advanced degrees may find employment in government agencies, national labs, academia, private business, environmental and agricultural consulting, and organic, international, and sustainable agriculture.

Post-Graduate Career Placements

University faculty positions, National Lab scientists, USDA scientists, Agribusiness owners, Extension agents, Natural Resource Conservation Service scientists, Soil fertility analysts/consultants, University administrators.

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Agricultural And Food Systems

AFS

302 **Introduction of Agroecology** 3 Prereq SoilS 210. Same as Soils 302.

445 **Field Analysis of Sustainable Food Systems** 3 Experiential course visiting farms, food processing and marketing facilities to develop understanding of issues and relationships of sustainable food systems. Credit not granted for both AFS 445 and 545.

501 **Current Research in Organic and Sustainable Agriculture** 3 Multidisciplinary framework to assess the sustainability of a range of farming and food systems.

545 **Field Analysis of Sustainable Food Systems** 3 Graduate-level counterpart of AFS 445; additional requirements. Credit not granted for both AFS 445 and 545.

Agricultural And Food Systems

BIOL

513 **Plant Metabolism** 3 Prereq Biol 320, MBioS 303. Metabolic processes unique to plants, including the primary incorporation of nitrogen, sulfur, carbon dioxide and phosphate into bio-molecules.

517 **Stress Physiology of Plants** 3 Prereq graduate standing. Temperature, light, salinity, water effects on physiological processes; mechanistic understanding of stress.

544 Nitrogen Cycling in the Earth's Systems 3 Prereq graduate standing. Nitrogen dynamics in terrestrial, aquatic, and atmospheric systems; nitrogen transformations in natural and managed systems and responses to human activities.

563 Field Ecology 2 (0-6) Prereq Biol 562. Field implementation of descriptive and experimental techniques to quantify the structure, composition, and interactions within natural communities. Field trips required.

564 Molecular Ecology and Phylogeography 3 Prereq Biol 301 or equivalent; Biol 405 or equivalent. Use of genetic markers for the study of ecological phenomena, including kinship, population structure, and phylogeography.

568 Conservation Ecology 3 Prereq Graduate standing. Diagnosis of endangered species, population viability analysis, invasive species ecology, landscape ecology and ecosystem management.

Agricultural And Food Systems

BSYSE

558 Groundwater Flow and Contaminant Transport 4 (3-3) Prereq Math 315; BsysE 351 or C E 351 or Geol 475. Physics of flow and contaminant transport in saturated porous media including governing equations, well hydraulics and computer modeling.

Civil Engineering

C E

315 Fluid Mechanics 3 Prereq M E 212; certified major in C E or instructor approval. Fluid statics, laminar and turbulent flow, similitude, pipe flow, boundary layer, lift and drag and measurement techniques.

Civil Engineering

CH E

585 Interfacial Phenomena 3 Prereq Ch E 301; Ch E 310; graduate standing. Chemical and physical nature of the interface including the molecular basis for interfacial forces and resulting macroscopic phenomena.

Civil Engineering

CHEM

332 Physical Chemistry 3 Prereq Math 220; Chem 331 each with a grade of C or better. Elementary quantum theory; molecular structure and spectra; bonding theory; reaction rates; photochemistry and radiation chemistry; energy states and statistical thermodynamics.

345 Organic Chemistry I 4 (3-3) Prereq Chem 102 or 106 with a grade of C or better. Survey of organic chemistry providing an overview of the chemistry of the functional groups.

346 Organic Chemistry II 3 Prereq Chem 345 with a grade of C or better. Lecture-only component of Chem 348. Advanced concepts in organic chemistry including mechanisms and multistep-synthesis. Credit not granted for both Chem 346 and 348.

348 Organic Chemistry II and Problem Solving 4 (3-2) Prereq Chem 345 with a grade of C or better. Advanced concepts in organic chemistry including mechanisms and multistep-synthesis; problem analysis and critical thinking development in organic chemistry. Credit not granted for both Chem 346 and 348.

501 Advanced Inorganic Chemistry I 3 Periodic table survey, typical compounds and their reactivity; models and reactivity, acid-base, oxidation-reduction, and electronic structure contributions.

Civil Engineering

CROPS

403 Advanced Cropping Systems 3 Prereq CropS 201; Pl P 429 or c//; or graduate standing. Understanding the management of constraints to crop production and quality; biological, physical, and chemical approaches to crop health management. Field trips required. Credit not granted for both CropS 403 and 503.

503 Advanced Cropping Systems 3 Prereq CropS 201; Pl P 429 or c//; or graduate standing. Graduate-level counterpart of CropS 403; additional requirements. Credit not granted for both CropS 403 and 503.

Civil Engineering

E MIC

586 Special Projects in Electron Microscopy V 2 (0-6) to 3 (0-9) May be repeated for credit. Practical training in one or more areas of electron microscopy; TEM, SEM, ultramicrotomy, specimen processing; confocal flourescent microscopy.

587 Special Topics in Electron Microscopy 1 May be repeated for credit; cumulative maximum 4 hours.

Civil Engineering

GEOL

579 Groundwater Geochemistry V 2-4 May be repeated for credit; cumulative maximum 4 hours. Prereq Chem 331, Geol 475. Organic and inorganic aqueous geochemistry; controls on groundwater contaminant fate.

Civil Engineering

MATH

548 Numerical Analysis 3 Prereq FORTRAN, C, or other programming language; Math 315; graduate standing. Graduate-level counterpart of Math 448; additional requirements. Credit not granted for both Math 448 and 548.

Civil Engineering

MBIOS

301 General Genetics 4 Prereq Biol 106 or 120; Biol 107; two semesters Chem. Principles of modern and classical genetics. Credit not normally granted for MBioS 301/Biol 301 and Biol 408.

303 Introductory Biochemistry 4 Prereq Chem 106; Chem 345. Modern biochemistry for undergraduates in the biological sciences.

426 Microbial Genetics 3 Prereq MBioS 301; 303. Genetics of bacteria, bacteriophages and plasmids; regulation of gene expression; genetic manipulation of microorganisms.

442 General Virology 3 Prereq MBioS 301; MBioS 303 or c//. The biology of bacterial, animal, and plant viruses. Credit not granted for both MBioS 442 and 542.

513 General Biochemistry I 3 Prereq MBioS 303, graduate standing. Graduate-level counterpart of MBioS 413; additional requirements. Credit not granted for both MBioS 413 and 513.

514 General Biochemistry 3 Prereq MBioS 413, or graduate standing. Graduate-level counterpart of MBioS 414; additional requirements. Credit not granted for both 414 and 514.

550 Microbial Physiology 3 Prereq MBioS 303, MBioS 305 and 306, or graduate standing. Graduate-level counterpart of MBioS 450; additional requirements. Credit not granted for both MBioS 450 and 550.

578 Bioinformatics 3 (2-3) Prereq MBioS 301, 303, or Cpt S 355; graduate standing. Graduate-level counterpart of MBioS 478; additional requirements. Credit not granted for both 478 and 578.

Civil Engineering

SOILS

301 Ecological Soil Management 3 Prereq SoilS 201. Soil and water conservation and management; land classification and reclamation; soils and environmental quality; sustainable agroecosystems.

302 Introduction of Agroecology 3 Prereq SoilS 201 Agroecological crop production through case study analyses and applications of ecological principles in traditional and modern farming systems.

360 World Agricultural Systems 3 Prereq two semesters physical or biological sciences. Same as CropS 360.

368 Introduction to Geographic Information Systems 3 (2-3) Prereq one course in biology, geology, or soils. Introduction to geographic information systems applied to landscape data; geographic coordinate systems and projections, make maps and use geodatabases.

374 Remote Sensing and Airphoto Interpretation 3 (2-3) Physical basis of remote sensing, fundamentals of aerial photography and image analysis applied to agriculture, forestry, wildland management problems.

412 Seminar 1 May be repeated for credit. Same as CropS 412.

413 Soil and Environmental Physics 3 (2-3) Prereq Math 107; Geol 101, 102 or SoilS 201. Physical properties of soils and their relationships to moisture, aeration, and temperature, plant-soil-atmospheric relationships, solute transport and soil salinity.

414 Environmental Biophysics 2 Prereq Math 107. Physical environment of living organisms (temperature, humidity, radiation, wind); heat and mass exchange and balance in plant and animal systems. Credit not granted for both SoilS 414 and 514.

415 Environmental Biophysics Laboratory 1 (0-3) Prereq SoilS 414 or c//. Experimental methods and procedures in environmental measurements; temperature, wind, radiation, and humidity measurements in biological environments. Credit not granted for both SoilS 415 and 515.

421 Environmental Soil Chemistry 3 Prereq two semesters of Chem; SoilS 201. Soil constituents; soil solutions: mineral equilibria; absorption reactions; acid/base reactions; oxidation-reduction; soil contaminants.

441 Soil Fertility 3 Prereq SoilS 201. Nutrient management impacts on crop productivity, soil and water quality; mineral requirements; soil testing; plant analysis; inorganic and organic fertilizers.

442 Soil Analytical Methods 2 (1-3) Prereq Soils 421, 441. Laboratory exercises and methodology for characterization of soil fertility and chemistry including CEC, acidity, carbon, nitrogen, and plant nutrients.

451 Soil Geography 3 (2-3) Prereq SoilS 201; SoilS 368; or by instructor permission. Study the geographic distribution of soil features and properties at hillslope to global scales. Field trips required.

468 ArcGIS and Geospatial Analysis 4 (2-6) Prereq Biol 120, Geol 101 or Soils 201. Geographic information systems applied to analysis of landscape data; maps, geographic coordinate systems and projections, geodatabases. Credit not granted for both SoilS 468 and 568.

480 Practicum in Organic Agriculture V 1 (0-3) to 6 (0-18) May be repeated for credit; cumulative maximum 12 hours. Prereq by permission. Applied principles and practices of organic agriculture; immersion and participation in all required farming/gardening activities.

495 Research Experience V 1-4 May be repeated for credit; cumulative maximum 12 hours. Same as CropS 495.

498 Professional Internship V V 1 (0-3) to 6 (0-18) May be repeated for credit; cumulative maximum 9 hours. Planned and supervised professional work experience.

499 Special Problems V 1 (0-3) to 4 (0-12) May be repeated for credit.

501 Seminar 1 May be repeated for credit. Presentation of research information.

502 Advanced Topics in Soils V 1-3 May be repeated for credit; cumulative maximum 6 hours. Interpretation, presentation, and discussion of current research on soils, uses, and management.

503 Advanced Soil Analysis V 1-3 May be repeated for credit; cumulative maximum 6 hours. By interview only. Soil research techniques; application of modern instrumentation to soil analysis.

505 Teaching Practicum 1 May be repeated for credit; cumulative maximum 4 hours. Supervised experience in classroom teaching; classroom preparation for lectures, discussions, laboratories; preparation and grading of exams.

508 Environmental Spatial Statistics 3 (2-2) Prereq Stat 412. Theoretical introduction and practical training in spatial data analysis for graduate students in the environmental sciences.

511 Research Proposal and Development 2 Same as CropS 511.

514 Environmental Biophysics 2 Prereq Math 107. Graduate-level counterpart of SoilS 414; additional requirements. Credit not granted for both SoilS 414 and 514.

515 Environmental Biophysics Laboratory 1 (0-3) Prereq SoilS 414 or c//. Graduate-level counterpart of SoilS 415; additional requirements. Credit not granted for both SoilS 415 and 515.

526 Soil Mineralogy 3 (2-3) Prereq SoilS 422; SoilS 454. Distribution and significance of soils minerals; weathering and reactivity of mineral structures; techniques of mineral identification including x-ray diffraction, chemical dissolution, optical and electron microscopy.

533 Advanced Vadose Processes 2 Prereq SoilS 413 or Soils 421 or by permission of instructor. Methods and models for water, heat, vapor and solute transport in the vadose zone; transfer functions to describe solute transport; non-linear parameter estimation; fate and transport of water, heat, and solutes in the vadose zone; hydrological and geochemical processes in unsaturated subsurface materials.

537 Soil Biochemistry 3 Prereq MBioS 303; Micro 201; SoilS 421. Origin, chemical structure, and significance of soil biochemical compounds. (Alt/yrs).

541 Soil-Plant-Microbial Interactions 3 Prereq SoilS 421, 431, or 441. Soil-plant-microbial relationships to plant nutrition, plant health, and environmental cleanup; rhizosphere chemistry and microbial ecology.

544 Nitrogen Cycling in the Earth's Systems 3 Prereq graduate standing. Same as Biol 544.

547 Soil Fertility Management 3 Prereq SoilS 441. Philosophy of fertilizer recommendations based on soil and plant tissue testing; principles of fertilizer manufacture, placement and use.

557 Advanced Soil Genesis and Classification 3 (2-3) Prereq SoilS 451. Processes of soil genesis as influenced by environmental factors; rationale and development of soil taxonomy; field study of pedological problems. Two lec and one 2-hr lab a wk; 1/2-day and 1-day field trips reqd. (Alt/yr).

568 ArcGIS and Geospatial Analysis 4 (2-6) Graduate-level counterpart of SoilS 486; additional requirements. Credit not granted for both SoilS 468 and 568.

574 Remote Sensing and Geospatial Analysis 3 (1-4) Prereq SoilS 374; 476 or equivalent. Digital image processing theory and geographic information systems applied to landscape analysis.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Civil Engineering

STAT

412 Statistical Methods in Research I 3 Prereq Stat 212, Math 140, 171, 202, or graduate standing. Intermediate statistical methods, design and analysis of research studies: completely randomized and randomized block designs, multiple regression, categorical data analysis.

512 Statistical Methods in Research II 3 (2-2) Prereq Stat 412 or equivalent. Analysis and interpretation of designed experiments: CRD, RCBD, spit-plot and repeated measures, multiple comparisons, multiple regression modeling, validation of assumptions.

Soil Science

Degree offered: Master of Science in Soil Science

Faculty working with graduate students: 75

Graduate students: 29

Graduate students receiving assistantships or scholarships: 79%

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal), TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

Twenty-one hours of graded credit are required, including seminar and state-wide tour. Twenty-six credits are required overall.

Program Description

The Department of Crop and Soil Sciences at Washington State University department offers M.S. and Ph.D. programs in Soil Science, with the ability to conduct graduate research in a variety of specialized areas within each discipline. The Soil Science program supports two major, overlapping research themes: sustainable agriculture and vadose zone hydrology. Within these broad themes, faculty lead collaborative research on organic, conservation and precision agriculture, biogeochemistry, contaminant transport, storm water management, nutrient cycling, microbial dynamics, climate change mitigation, proximal soil sensing, digital soil mapping, and bioenergy development. Soils faculty work closely with crops and horticulture faculty and with the Center for Environmental Research, Education and Outreach to apply this expertise to sustainable natural and agricultural systems. We have several research projects conducted in cooperation with the United States Department of Agriculture (USDA) through the USDA Agricultural Research Service (USDA-ARS) and USDA Natural Resources Conservation Service (USDA-NRCS) in addition to research projects being conducted in association with other universities. Research facilities include state of the art laboratories and greenhouse facilities, and research farms located in Pullman, as well as throughout the state at five Research and Extension Centers. Graduate students learn valuable skills and knowledge working side by side with faculty members and research technicians providing them the opportunity to play an integral role in the advancement of their major advisor's research. Students also have the opportunity to gain leadership, communication, and instructional experience through the option of serving as teaching assistants for one or more courses within their discipline. Qualified students typically receive competitive teaching or research assistantships. These assistantships provide non-resident and resident tuition waivers, paid health insurance, and stipends to help cover living expenses.

Degree Description

Training and Professional Development Opportunities

Students have the opportunity to gain leadership, communication, and instructional experience through the option of serving as teaching assistants for one or more courses within their discipline. Extension program delivery, and Graduate School teacher training and grant proposal writing workshop opportunities are also available.

Post-Graduate Employment Opportunities

Soil scientists with advanced degrees may find employment in government agencies, national labs, academia, private business, environmental and agricultural consulting, and organic, international, and sustainable agriculture.

Post-Graduate Career Placements

National Lab scientists, USDA scientists, Agribusiness owners, Extension agents, Natural Resource Conservation Service scientists, Soil fertility analysts/consultants.

Contact Information

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Robert Allan, Ashok Alva, Byung-Kee Baik, Chuck Benbrook, David Bezdicek, Rick Boydston, Ian Burke, Alan Busacca, Colin Campbell, Kimberly Campbell, Lynne Carpenter-Boggs, Arron Carter, Mary Chevalier, Douglas Cobos, Craig Cogger, Harold Collins, Clarice Coyne, Joan Davenport, James Durfey, Markus Flury, Ann-Marie Fortuna, Steven Fransen, Bruce Frazier, Eugene Fuerst, Kulvinder Gill, Jessica Goldberger, Stephanie Greene, Stephen Guy, James Harsh, David Huggins, Scot Hulbert, Devra Jarvis, Richard Johnson, William Johnston, Stephen Jones, Ann Kennedy, Stephen Kenny, Kimberlee Kidwell, Theodore Kisha, Marvin Kleene, Andris Kleinhofs, Richard Koenig, Hans Kok, Shiou Kuo, Thomas Lumpkin, Mark Mazzola, Phillip Miklas, Timothy Miller, Eric Miltner, Alexei Morgounov, Craig Morris, Fred Muehlbauer, Michael Neff, William Pan, Vickie Parker-Clark, Catherine Perillo, Francis Peryea, Francis Pierce, John Reganold, Diana Roberts, Ronald Roe, William Schillinger, Jeffrey Smith, Gwen Stahnke, Mark Stannard, Camille Steber, Robert Stevens, Michael Swan, Jeffrey Ullman, Steven Ullrich, Dietrich Vonwettstein, Robert Warner, Dawn Wellman, Joseph Yenish and Frank Young.

Agricultural And Food Systems

AFS

302 **Introduction of Agroecology** 3 Prereq SoilS 210. Same as Soils 302.

445 **Field Analysis of Sustainable Food Systems** 3 Experiential course visiting farms, food processing and marketing facilities to develop understanding of issues and relationships of sustainable food systems. Credit not granted for both AFS 445 and 545.

501 **Current Research in Organic and Sustainable Agriculture** 3 Multidisciplinary framework to assess the sustainability of a range of farming and food systems.

545 **Field Analysis of Sustainable Food Systems** 3 Graduate-level counterpart of AFS 445; additional requirements. Credit not granted for both AFS 445 and 545.

Agricultural And Food Systems

BIOL

513 **Plant Metabolism** 3 Prereq Biol 320, MBioS 303. Metabolic processes unique to plants, including the primary incorporation of nitrogen, sulfur, carbon dioxide and phosphate into bio-molecules.

517 **Stress Physiology of Plants** 3 Prereq graduate standing. Temperature, light, salinity, water effects on physiological processes; mechanistic understanding of stress.

544 **Nitrogen Cycling in the Earth's Systems** 3 Prereq graduate standing. Nitrogen dynamics in terrestrial, aquatic, and atmospheric systems; nitrogen transformations in natural and managed systems and responses to human activities.

563 **Field Ecology** 2 (0-6) Prereq Biol 562. Field implementation of descriptive and experimental techniques to quantify the structure, composition, and interactions within natural communities. Field trips required.

568 **Conservation Ecology** 3 Prereq Graduate standing. Diagnosis of endangered species, population viability analysis, invasive species ecology, landscape ecology and ecosystem management.

Agricultural And Food Systems

BSYSE

558 **Groundwater Flow and Contaminant Transport** 4 (3-3) Prereq Math 315; BsysE 351 or C E 351 or Geol 475. Physics of flow and contaminant transport in saturated porous media including governing equations, well hydraulics and computer modeling.

Civil Engineering

C E

315 **Fluid Mechanics** 3 Prereq M E 212; certified major in C E or instructor approval. Fluid statics, laminar and turbulent flow, similitude, pipe flow, boundary layer, lift and drag and measurement techniques.

Civil Engineering

CH E

585 **Interfacial Phenomena** 3 Prereq Ch E 301; Ch E 310; graduate standing. Chemical and physical nature of the interface including the molecular basis for interfacial forces and resulting macroscopic phenomena.

Civil Engineering

CHEM

332 **Physical Chemistry** 3 Prereq Math 220; Chem 331 each with a grade of C or better. Elementary quantum theory; molecular structure and spectra; bonding theory; reaction rates; photochemistry and radiation chemistry; energy states and statistical thermodynamics.

345 **Organic Chemistry I** 4 (3-3) Prereq Chem 102 or 106 with a grade of C or better. Survey of organic chemistry providing an overview of the chemistry of the functional groups.

346 **Organic Chemistry II** 3 Prereq Chem 345 with a grade of C or better. Lecture-only component of Chem 348. Advanced concepts in organic chemistry including mechanisms and multi-step-synthesis. Credit not granted for both Chem 346 and 348.

348 **Organic Chemistry II and Problem Solving** 4 (3-2) Prereq Chem 345 with a grade of C or better. Advanced concepts in organic chemistry including mechanisms and multistep-synthesis; problem analysis and critical thinking development in organic chemistry. Credit not granted for both Chem 346 and 348.

501 **Advanced Inorganic Chemistry I** 3 Periodic table survey, typical compounds and their reactivity; models and reactivity, acid-base, oxidation-reduction, and electronic structure contributions.

Civil Engineering

CROPS

403 **Advanced Cropping Systems** 3 Prereq CropS 201; Pl P 429 or c//; or graduate standing. Understanding the management of constraints to crop production and quality; biological, physical, and chemical approaches to crop health management. Field trips required. Credit not granted for both CropS 403 and 503.

503 **Advanced Cropping Systems** 3 Prereq CropS 201; Pl P 429 or c//; or graduate standing. Graduate-level counterpart of CropS 403; additional requirements. Credit not granted for both CropS 403 and 503.

Civil Engineering

E MIC

586 **Special Projects in Electron Microscopy** V 2 (0-6) to 3 (0-9) May be repeated for credit. Practical training in one or more areas of electron microscopy; TEM, SEM, ultramicrotomy, specimen processing; confocal flourescent microscopy.

587 **Special Topics in Electron Microscopy** 1 May be repeated for credit; cumulative maximum 4 hours.

Civil Engineering

GEOL

579 **Groundwater Geochemistry** V 2-4 May be repeated for credit; cumulative maximum 4 hours. Prereq Chem 331, Geol 475. Organic and inorganic aqueous geochemistry; controls on groundwater contaminant fate.

Civil Engineering

MATH

548 **Numerical Analysis** 3 Prereq FORTRAN, C, or other programming language; Math 315; graduate standing. Graduate-level counterpart of Math 448; additional requirements. Credit not granted for both Math 448 and 548.

Civil Engineering

MBIOS

301 **General Genetics** 4 Prereq Biol 106 or 120; Biol 107; two semesters Chem. Principles of modern and classical genetics. Credit not normally granted for MBioS 301/Biol 301 and Biol 408.

303 **Introductory Biochemistry** 4 Prereq Chem 106; Chem 345. Modern biochemistry for undergraduates in the biological sciences.

426 **Microbial Genetics** 3 Prereq MBioS 301; 303. Genetics of bacteria, bacteriophages and plasmids; regulation of gene expression; genetic manipulation of microorganisms.

442 **General Virology** 3 Prereq MBioS 301; MBioS 303 or c//. The biology of bacterial, animal, and plant viruses. Credit not granted for both MBioS 442 and 542.

513 **General Biochemistry I** 3 Prereq MBioS 303, graduate standing. Graduate-level counterpart of MBioS 413; additional requirements. Credit not granted for both MBioS 413 and 513.

514 **General Biochemistry** 3 Prereq MBioS 413, or graduate standing. Graduate-level counterpart of MBioS 414; additional requirements. Credit not granted for both 414 and 514.

550 **Microbial Physiology** 3 Prereq MBioS 303, MBioS 305 and 306, or graduate standing. Graduate-level counterpart of MBioS 450; additional requirements. Credit not granted for both MBioS 450 and 550.

578 **Bioinformatics** 3 (2-3) Prereq MBioS 301, 303, or Cpt S 355; graduate standing. Graduate-level counterpart of MBioS 478; additional requirements. Credit not granted for both 478 and 578.

Civil Engineering

SOILS

301 **Ecological Soil Management** 3 Prereq SoilS 201. Soil and water conservation and management; land classification and reclamation; soils and environmental quality; sustainable agroecosystems.

302 **Introduction of Agroecology** 3 Prereq SoilS 201 Agroecological crop production through case study analyses and applications of ecological principles in traditional and modern farming systems.

360 **World Agricultural Systems** 3 Prereq two semesters physical or biological sciences. Same as CropS 360.

368 **Introduction to Geographic Information Systems** 3 (2-3) Prereq one course in biology, geology, or soils. Introduction to geographic information systems applied to landscape data; geographic coordinate systems and projections, make maps and use geodatabases.

374 **Remote Sensing and Airphoto Interpretation** 3 (2-3) Physical basis of remote sensing, fundamentals of aerial photography and image analysis applied to agriculture, forestry, wildland management problems.

412 **Seminar** 1 May be repeated for credit. Same as CropS 412.

413 **Soil and Environmental Physics** 3 (2-3) Prereq Math 107; Geol 101, 102 or SoilS 201. Physical properties of soils and their relationships to moisture, aeration, and temperature, plant-soil-atmospheric relationships, solute transport and soil salinity.

414 **Environmental Biophysics** 2 Prereq Math 107. Physical environment of living organisms (temperature, humidity, radiation, wind); heat and mass exchange and balance in plant and animal systems. Credit not granted for both SoilS 414 and 514.

415 **Environmental Biophysics Laboratory** 1 (0-3) Prereq SoilS 414 or c//. Experimental methods and procedures in environmental measurements; temperature, wind, radiation, and humidity measurements in biological environments. Credit not granted for both SoilS 415 and 515.

421 **Environmental Soil Chemistry** 3 Prereq two semesters of Chem; SoilS 201. Soil constituents; soil solutions: mineral equilibria; absorption reactions; acid/base reactions; oxidation-reduction; soil contaminants.

441 **Soil Fertility** 3 Prereq SoilS 201. Nutrient management impacts on crop productivity, soil and water quality; mineral requirements; soil testing; plant analysis; inorganic and organic fertilizers.

442 **Soil Analytical Methods** 2 (1-3) Prereq Soils 421, 441. Laboratory exercises and methodology for characterization of soil fertility and chemistry including CEC, acidity, carbon, nitrogen, and plant nutrients.

451 **Soil Geography** 3 (2-3) Prereq SoilS 201; SoilS 368; or by instructor permission. Study the geographic distribution of soil features and properties at hillslope to global scales. Field trips required.

468 **ArcGIS and Geospatial Analysis** 4 (2-6) Prereq Biol 120, Geol 101 or Soils 201. Geographic information systems applied to analysis of landscape data; maps, geographic coordinate systems and projections, geodatabases. Credit not granted for both SoilS 468 and 568.

480 **Practicum in Organic Agriculture** V 1 (0-3) to 6 (0-18) May be repeated for credit; cumulative maximum 12 hours. Prereq by permission. Applied principles and practices of organic agriculture; immersion and participation in all required farming/gardening activities.

495 **Research Experience** V 1-4 May be repeated for credit; cumulative maximum 12 hours. Same as CropS 495.

498 **Professional Internship V** V 1 (0-3) to 6 (0-18) May be repeated for credit; cumulative maximum 9 hours. Planned and supervised professional work experience.

499 **Special Problems** V 1 (0-3) to 4 (0-12) May be repeated for credit.

501 **Seminar** 1 May be repeated for credit. Presentation of research information.

502 **Advanced Topics in Soils** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Interpretation, presentation, and discussion of current research on soils, uses, and management.

503 **Advanced Soil Analysis** V 1-3 May be repeated for credit; cumulative maximum 6 hours. By interview only. Soil research techniques; application of modern instrumentation to soil analysis.

505 **Teaching Practicum** 1 May be repeated for credit; cumulative maximum 4 hours. Supervised experience in classroom teaching; classroom preparation for lectures, discussions, laboratories; preparation and grading of exams.

508 **Environmental Spatial Statistics** 3 (2-2) Prereq Stat 412. Theoretical introduction and practical training in spatial data analysis for graduate students in the environmental sciences.

511 Research Proposal and Development 2 Same as CropS 511.

514 Environmental Biophysics 2 Prereq Math 107. Graduate-level counterpart of SoilS 414; additional requirements. Credit not granted for both SoilS 414 and 514.

515 Environmental Biophysics Laboratory 1 (0-3) Prereq SoilS 414 or c//. Graduate-level counterpart of SoilS 415; additional requirements. Credit not granted for both SoilS 415 and 515.

526 Soil Mineralogy 3 (2-3) Prereq SoilS 422; SoilS 454. Distribution and significance of soils minerals; weathering and reactivity of mineral structures; techniques of mineral identification including x-ray diffraction, chemical dissolution, optical and electron microscopy.

533 Advanced Vadose Processes 2 Prereq SoilS 413 or Soils 421 or by permission of instructor. Methods and models for water, heat, vapor and solute transport in the vadose zone; transfer functions to describe solute transport; non-linear parameter estimation; fate and transport of water, heat, and solutes in the vadose zone; hydrological and geochemical processes in unsaturated subsurface materials.

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541 Soil-Plant-Microbial Interactions 3 Prereq SoilS 421, 431, or 441. Soil-plant-microbial relationships to plant nutrition, plant health, and environmental cleanup; rhizosphere chemistry and microbial ecology.

544 Nitrogen Cycling in the Earth's Systems 3 Prereq graduate standing. Same as Biol 544.

547 Soil Fertility Management 3 Prereq SoilS 441. Philosophy of fertilizer recommendations based on soil and plant tissue testing; principles of fertilizer manufacture, placement and use.

557 Advanced Soil Genesis and Classification 3 (2-3) Prereq SoilS 451. Processes of soil genesis as influenced by environmental factors; rationale and development of soil taxonomy; field study of pedological problems. Two lec and one 2-hr lab a wk; 1/2-day and 1-day field trips reqd. (Alt/yr).

568 ArcGIS and Geospatial Analysis 4 (2-6) Graduate-level counterpart of SoilS 486; additional requirements. Credit not granted for both SoilS 468 and 568.

574 Remote Sensing and Geospatial Analysis 3 (1-4) Prereq SoilS 374; 476 or equivalent. Digital image processing theory and geographic information systems applied to landscape analysis.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Civil Engineering

STAT

412 Statistical Methods in Research I 3 Prereq Stat 212, Math 140, 171, 202, or graduate standing. Intermediate statistical methods, design and analysis of research studies: completely randomized and randomized block designs, multiple regression, categorical data analysis.

512 Statistical Methods in Research II 3 (2-2) Prereq Stat 412 or equivalent. Analysis and interpretation of designed experiments: CRD, RCBD, spit-plot and repeated measures, multiple comparisons, multiple regression modeling, validation of assumptions.

Soil Science

Degree offered: Master of Science in Soil Science - Non Thesis

Faculty working with graduate students: 75

Graduate students: 29

Graduate students receiving assistantships or scholarships: 79%

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal), TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

Twenty-six hours of graded coursework are required, including seminar and state-wide tour. Thirty hours are required overall.

Program Description

The Department of Crop and Soil Sciences at Washington State University department offers M.S. and Ph.D. programs in Soil Science, with the ability to conduct graduate research in a variety of specialized areas within each discipline. The Soil Science program supports two major, overlapping research themes: sustainable agriculture and vadose zone hydrology. Within these broad themes, faculty lead collaborative research on organic, conservation and precision agriculture, biogeochemistry, contaminant transport, storm water management, nutrient cycling, microbial dynamics, climate change mitigation, proximal soil sensing, digital soil mapping, and bioenergy development. Soils faculty work closely with crops and horticulture faculty and with the Center for Environmental Research, Education and Outreach to apply this expertise to sustainable natural and agricultural systems. We have several research projects conducted in cooperation with the United States Department of Agriculture (USDA) through the USDA Agricultural Research Service (USDA-ARS) and USDA Natural Resources Conservation Service (USDA-NRCS) in addition to research projects being conducted in association with other universities. Research facilities include state of the art laboratories and greenhouse facilities, and research farms located in Pullman, as well as throughout the state at five Research and Extension Centers. Graduate students learn valuable skills and knowledge working side by side with faculty members and research technicians providing them the opportunity to play an integral role in the advancement of their major advisor's research. Students also have the opportunity to gain leadership, communication, and instructional experience through the option of serving as teaching assistants for one or more courses within their discipline. Qualified students typically receive competitive teaching or research assistantships. These assistantships provide non-resident and resident tuition waivers, paid health insurance, and stipends to help cover living expenses.

Degree Description

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Students have the opportunity to gain leadership, communication, and instructional experience through the option of serving as teaching assistants for one or more courses within their discipline. Extension program delivery, and Graduate School teacher training and grant proposal writing workshop opportunities are also available.

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Soil scientists with advanced degrees may find employment in government agencies, national labs, academia, private business, environmental and agricultural consulting, and organic, international, and sustainable agriculture.

Contact Information

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Agricultural And Food Systems

AFS

302 **Introduction of Agroecology** 3 Prereq SoilS 210. Same as Soils 302.

445 **Field Analysis of Sustainable Food Systems** 3 Experiential course visiting farms, food processing and marketing facilities to develop understanding of issues and relationships of sustainable food systems. Credit not granted for both AFS 445 and 545.

501 **Current Research in Organic and Sustainable Agriculture** 3 Multidisciplinary framework to assess the sustainability of a range of farming and food systems.

545 **Field Analysis of Sustainable Food Systems** 3 Graduate-level counterpart of AFS 445; additional requirements. Credit not granted for both AFS 445 and 545.

Agricultural And Food Systems

BIOL

513 **Plant Metabolism** 3 Prereq Biol 320, MBioS 303. Metabolic processes unique to plants, including the primary incorporation of nitrogen, sulfur, carbon dioxide and phosphate into bio-molecules.

517 **Stress Physiology of Plants** 3 Prereq graduate standing. Temperature, light, salinity, water effects on physiological processes; mechanistic understanding of stress.

544 **Nitrogen Cycling in the Earth's Systems** 3 Prereq graduate standing. Nitrogen dynamics in terrestrial, aquatic, and atmospheric systems; nitrogen transformations in natural and managed systems and responses to human activities.

563 **Field Ecology** 2 (0-6) Prereq Biol 562. Field implementation of descriptive and experimental techniques to quantify the structure, composition, and interactions within natural communities. Field trips required.

568 **Conservation Ecology** 3 Prereq Graduate standing. Diagnosis of endangered species, population viability analysis, invasive species ecology, landscape ecology and ecosystem management.

Agricultural And Food Systems

BSYSE

558 **Groundwater Flow and Contaminant Transport** 4 (3-3) Prereq Math 315; BsysE 351 or C E 351 or Geol 475. Physics of flow and contaminant transport in saturated porous media including governing equations, well hydraulics and computer modeling.

Civil Engineering

C E

315 **Fluid Mechanics** 3 Prereq M E 212; certified major in C E or instructor approval. Fluid statics, laminar and turbulent flow, similitude, pipe flow, boundary layer, lift and drag and measurement techniques.

Civil Engineering

CH E

585 **Interfacial Phenomena** 3 Prereq Ch E 301; Ch E 310; graduate standing. Chemical and physical nature of the interface including the molecular basis for interfacial forces and resulting macroscopic phenomena.

Civil Engineering

CHEM

332 **Physical Chemistry** 3 Prereq Math 220; Chem 331 each with a grade of C or better. Elementary quantum theory; molecular structure and spectra; bonding theory; reaction rates; photochemistry and radiation chemistry; energy states and statistical thermodynamics.

345 **Organic Chemistry I** 4 (3-3) Prereq Chem 102 or 106 with a grade of C or better. Survey of organic chemistry providing an overview of the chemistry of the functional groups.

346 **Organic Chemistry II** 3 Prereq Chem 345 with a grade of C or better. Lecture-only component of Chem 348. Advanced concepts in organic chemistry including mechanisms and multistep-synthesis. Credit not granted for both Chem 346 and 348.

348 **Organic Chemistry II and Problem Solving** 4 (3-2) Prereq Chem 345 with a grade of C or better. Advanced concepts in organic chemistry including mechanisms and multistep-synthesis; problem analysis and critical thinking development in organic chemistry. Credit not granted for both Chem 346 and 348.

501 **Advanced Inorganic Chemistry I** 3 Periodic table survey, typical compounds and their reactivity; models and reactivity, acid-base, oxidation-reduction, and electronic structure contributions.

Civil Engineering

CROPS

403 **Advanced Cropping Systems** 3 Prereq CropS 201; Pl P 429 or c//; or graduate standing. Understanding the management of constraints to crop production and quality; biological, physical, and chemical approaches to crop health management. Field trips required. Credit not granted for both CropS 403 and 503.

503 **Advanced Cropping Systems** 3 Prereq CropS 201; Pl P 429 or c//; or graduate standing. Graduate-level counterpart of CropS 403; additional requirements. Credit not granted for both CropS 403 and 503.

Civil Engineering

E MIC

586 Special Projects in Electron Microscopy V 2 (0-6) to 3 (0-9) May be repeated for credit. Practical training in one or more areas of electron microscopy; TEM, SEM, ultramicrotomy, specimen processing; confocal flourescent microscopy.

587 Special Topics in Electron Microscopy 1 May be repeated for credit; cumulative maximum 4 hours.

Civil Engineering

GEOL

579 Groundwater Geochemistry V 2-4 May be repeated for credit; cumulative maximum 4 hours. Prereq Chem 331, Geol 475. Organic and inorganic aqueous geochemistry; controls on groundwater contaminant fate.

Civil Engineering

MATH

548 Numerical Analysis 3 Prereq FORTRAN, C, or other programming language; Math 315; graduate standing. Graduate-level counterpart of Math 448; additional requirements. Credit not granted for both Math 448 and 548.

Civil Engineering

MBIOS

301 General Genetics 4 Prereq Biol 106 or 120; Biol 107; two semesters Chem. Principles of modern and classical genetics. Credit not normally granted for MBioS 301/Biol 301 and Biol 408.

303 Introductory Biochemistry 4 Prereq Chem 106; Chem 345. Modern biochemistry for undergraduates in the biological sciences.

426 Microbial Genetics 3 Prereq MBioS 301; 303. Genetics of bacteria, bacteriophages and plasmids; regulation of gene expression; genetic manipulation of microorganisms.

442 General Virology 3 Prereq MBioS 301; MBioS 303 or c//. The biology of bacterial, animal, and plant viruses. Credit not granted for both MBioS 442 and 542.

513 General Biochemistry I 3 Prereq MBioS 303, graduate standing. Graduate-level counterpart of MBioS 413; additional requirements. Credit not granted for both MBioS 413 and 513.

514 General Biochemistry 3 Prereq MBioS 413, or graduate standing. Graduate-level counterpart of MBioS 414; additional requirements. Credit not granted for both 414 and 514.

550 Microbial Physiology 3 Prereq MBioS 303, MBioS 305 and 306, or graduate standing. Graduate-level counterpart of MBioS 450; additional requirements. Credit not granted for both MBioS 450 and 550.

578 Bioinformatics 3 (2-3) Prereq MBioS 301, 303, or Cpt S 355; graduate standing. Graduate-level counterpart of MBioS 478; additional requirements. Credit not granted for both 478 and 578.

Civil Engineering

SOILS

301 Ecological Soil Management 3 Prereq SoilS 201. Soil and water conservation and management; land classification and reclamation; soils and environmental quality; sustainable agroecosystems.

302 Introduction of Agroecology 3 Prereq SoilS 201 Agroecological crop production through case study analyses and applications of ecological principles in traditional and modern farming systems.

360 World Agricultural Systems 3 Prereq two semesters physical or biological sciences. Same as CropS 360.

368 Introduction to Geographic Information Systems 3 (2-3) Prereq one course in biology, geology, or soils. Introduction to geographic information systems applied to landscape data; geographic coordinate systems and projections, make maps and use geodatabases.

374 Remote Sensing and Airphoto Interpretation 3 (2-3) Physical basis of remote sensing, fundamentals of aerial photography and image analysis applied to agriculture, forestry, wildland management problems.

412 Seminar 1 May be repeated for credit. Same as CropS 412.

413 Soil and Environmental Physics 3 (2-3) Prereq Math 107; Geol 101, 102 or SoilS 201. Physical properties of soils and their relationships to moisture, aeration, and temperature, plant-soil-atmospheric relationships, solute transport and soil salinity.

414 Environmental Biophysics 2 Prereq Math 107. Physical environment of living organisms (temperature, humidity, radiation, wind); heat and mass exchange and balance in plant and animal systems. Credit not granted for both SoilS 414 and 514.

415 Environmental Biophysics Laboratory 1 (0-3) Prereq SoilS 414 or c//. Experimental methods and procedures in environmental measurements; temperature, wind, radiation, and humidity measurements in biological environments. Credit not granted for both SoilS 415 and 515.

421 Environmental Soil Chemistry 3 Prereq two semesters of Chem; SoilS 201. Soil constituents; soil solutions: mineral equilibria; absorption reactions; acid/base reactions; oxidation-reduction; soil contaminants.

441 Soil Fertility 3 Prereq SoilS 201. Nutrient management impacts on crop productivity, soil and water quality; mineral requirements; soil testing; plant analysis; inorganic and organic fertilizers.

442 Soil Analytical Methods 2 (1-3) Prereq Soils 421, 441. Laboratory exercises and methodology for characterization of soil fertility and chemistry including CEC, acidity, carbon, nitrogen, and plant nutrients.

451 Soil Geography 3 (2-3) Prereq SoilS 201; SoilS 368; or by instructor permission. Study the geographic distribution of soil features and properties at hillslope to global scales. Field trips required.

468 ArcGIS and Geospatial Analysis 4 (2-6) Prereq Biol 120, Geol 101 or Soils 201. Geographic information systems applied to analysis of landscape data; maps, geographic coordinate systems and projections, geodatabases. Credit not granted for both SoilS 468 and 568.

480 Practicum in Organic Agriculture V 1 (0-3) to 6 (0-18) May be repeated for credit; cumulative maximum 12 hours. Prereq by permission. Applied principles and practices of organic agriculture; immersion and participation in all required farming/gardening activities.

495 Research Experience V 1-4 May be repeated for credit; cumulative maximum 12 hours. Same as CropS 495.

498 Professional Internship V V 1 (0-3) to 6 (0-18) May be repeated for credit; cumulative maximum 9 hours. Planned and supervised professional work experience.

499 Special Problems V 1 (0-3) to 4 (0-12) May be repeated for credit.

501 **Seminar** 1 May be repeated for credit. Presentation of research information.

502 **Advanced Topics in Soils** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Interpretation, presentation, and discussion of current research on soils, uses, and management.

503 **Advanced Soil Analysis** V 1-3 May be repeated for credit; cumulative maximum 6 hours. By interview only. Soil research techniques; application of modern instrumentation to soil analysis.

505 **Teaching Practicum** 1 May be repeated for credit; cumulative maximum 4 hours. Supervised experience in classroom teaching; classroom preparation for lectures, discussions, laboratories; preparation and grading of exams.

508 **Environmental Spatial Statistics** 3 (2-2) Prereq Stat 412. Theoretical introduction and practical training in spatial data analysis for graduate students in the environmental sciences.

511 **Research Proposal and Development** 2 Same as CropS 511.

514 **Environmental Biophysics** 2 Prereq Math 107. Graduate-level counterpart of SoilS 414; additional requirements. Credit not granted for both SoilS 414 and 514.

515 **Environmental Biophysics Laboratory** 1 (0-3) Prereq SoilS 414 or c//. Graduate-level counterpart of SoilS 415; additional requirements. Credit not granted for both SoilS 415 and 515.

526 **Soil Mineralogy** 3 (2-3) Prereq SoilS 422; SoilS 454. Distribution and significance of soils minerals; weathering and reactivity of mineral structures; techniques of mineral identification including x-ray diffraction, chemical dissolution, optical and electron microscopy.

533 **Advanced Vadose Processes** 2 Prereq SoilS 413 or Soils 421 or by permission of instructor. Methods and models for water, heat, vapor and solute transport in the vadose zone; transfer functions to describe solute transport; non-linear parameter estimation; fate and transport of water, heat, and solutes in the vadose zone; hydrological and geochemical processes in unsaturated subsurface materials.

537 **Soil Biochemistry** 3 Prereq MBioS 303; Micro 201; SoilS 421. Origin, chemical structure, and significance of soil biochemical compounds. (Alt/yrs).

541 **Soil-Plant-Microbial Interactions** 3 Prereq SoilS 421, 431, or 441. Soil-plant-microbial relationships to plant nutrition, plant health, and environmental cleanup; rhizosphere chemistry and microbial ecology.

544 **Nitrogen Cycling in the Earth's Systems** 3 Prereq graduate standing. Same as Biol 544.

547 **Soil Fertility Management** 3 Prereq SoilS 441. Philosophy of fertilizer recommendations based on soil and plant tissue testing; principles of fertilizer manufacture, placement and use.

557 **Advanced Soil Genesis and Classification** 3 (2-3) Prereq SoilS 451. Processes of soil genesis as influenced by environmental factors; rationale and development of soil taxonomy; field study of pedological problems. Two lec and one 2-hr lab a wk; 1/2-day and 1-day field trips reqd. (Alt/yr).

568 **ArcGIS and Geospatial Analysis** 4 (2-6) Graduate-level counterpart of SoilS 486; additional requirements. Credit not granted for both SoilS 468 and 568.

574 **Remote Sensing and Geospatial Analysis** 3 (1-4) Prereq SoilS 374; 476 or equivalent. Digital image processing theory and geographic information systems applied to landscape analysis.

600 **Special Projects or Independent Study** V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 **Master's Special Problems, Directed Study, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

Civil Engineering

STAT

412 **Statistical Methods in Research I** 3 Prereq Stat 212, Math 140, 171, 202, or graduate standing. Intermediate statistical methods, design and analysis of research studies: completely randomized and randomized block designs, multiple regression, categorical data analysis.

512 **Statistical Methods in Research II** 3 (2-2) Prereq Stat 412 or equivalent. Analysis and interpretation of designed experiments: CRD, RCBD, spit-plot and repeated measures, multiple comparisons, multiple regression modeling, validation of assumptions.

Speech and Hearing Sciences

Degree offered: Master of Arts in Speech and Hearing Sciences

Faculty working with graduate students: 18

Graduate students: 48

Graduate students receiving assistantships or scholarships: 4%

Program offered: Spokane

Tests required: GRE (Combined)

Deadline: Fall: January 10
Spring: July 1

Degree Description

The Department of Speech and Hearing Sciences' master's program in speech-language pathology is based at WSU Spokane. A bachelor's degree in speech-language pathology is not mandatory; however, students entering the graduate program with undergraduate majors in related fields must complete a core of prerequisites including 31 hours of undergraduate courses. All students are required to complete a statistics course. This is considered a prerequisite, and not part of the graduate program, although course may be taken at graduate level.The program stresses the application of theory through work in the University's clinics as well as in clinical placements throughout the state. A thesis and a non-thesis option are available. The program provides the basis for certification in speech-language pathology by the American Speech-Language-Hearing Association (ASHA), the certificate of clinical competence or the CCC. The master's degree specialization in speech-language pathology is accredited by ASHA and certified by the State Board of Education.

Contact Information

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Faculty

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Speech And Hearing Sciences

SHS

490 **Special Topics in Speech and Hearing Sciences** V 1-3 May be repeated for credit; cumulative maximum 9 hours. Study of specialized topics in speech and hearing sciences.

501 Research Methods 3 Philosophy of research, types of literature; experimental and descriptive designs; application of statistics; analysis of statistical results.

503 Research Methods II 2 Experimental and descriptive designs, application of statistics, analysis of statistical results. SHS graduate student; all undergraduate prerequisite courses completed.

540 Special Topics in Speech and Hearing Sciences V 1-3 May be repeated for credit; cumulative maximum 9 hours. Advanced study of specialized topics in speech and hearing sciences. SHS graduate student; all undergraduate prerequisite courses completed.

542 Infant and Toddler Communication and Language 3 Typical development of communication and language in the birth to 5 year-old population; impairments affecting development; disorders; assessment; intervention. SHS graduate student; all undergraduate prerequisite courses completed.

543 School Age and Adolescent Language 3 Language development in typically developing and language impaired school age and adolescent students; disorder types; implications for assessment and intervention. SHS graduate student; all undergraduate prerequisite courses completed.

550 Special Topics in Speech and Hearing Sciences V 1-3 May be repeated for credit; cumulative maximum 9 hours. Study of specialized topics in speech and hearing sciences. SHS graduate student; all undergraduate prerequisite courses completed.

555 Bilingual and Cultural Issues 2 Cultural and linguistic variables that may impact speech-language pathology services of culturally and linguistically diverse populations; assessment and treatment considerations.

556 Problems in Stuttering 2 Historical and current literature; problem-solving strategies applied to theoretical and clinical problems in stuttering. SHS graduate student; all undergraduate prerequisite courses completed.

557 Cleft Palate and Craniofacial Disorders 2 Speech and voice problems associated with clefts of the lip and palate. SHS graduate student; all undergraduate prerequisite courses completed.

560 Special Topics in Speech and Hearing Sciences V 1-3 May be repeated for credit; cumulative maximum 9 hours. Advanced study of specialized topics in speech and hearing sciences. SHS graduate student; all undergraduate prerequisite courses completed.

563 Dysphagia 3 Anatomy and physiology of swallowing; evaluation and treatment of swallowing disorders. SHS graduate student; all undergraduate prerequisite courses completed.

565 Augmentative Communication 3 Augmentative communication theory; implementation, training strategies, ongoing adjustments, and evaluating effectiveness. SHS graduate student; all undergraduate prerequisite courses completed.

566 Off-Campus Practicum Public School Setting V 2 (0-6) to 6 (0-18) May be repeated for credit; cumulative maximum 15 hours. Prereq SHS 575; by interview only. Advanced clinical practice in a public school setting; evaluation and treatment of speech, language, and hearing disorders. SHS graduate student; all undergraduate prerequisite courses completed.

567 Issues in Public School Service Delivery 3 Clinical operations, policies, procedures, including legal, ethical, and professional considerations in the schools. SHS graduate student; all undergraduate prerequisite courses completed.

568 Off-campus Practicum Clinical Setting V 2 (0-6) to 6 (0-18) May be repeated for credit; cumulative maximum 15 hours. Prereq by interview only. Advanced clinical practice in an off-campus clinical/medical setting; evaluation and treatment of speech, language and hearing disorders.

570 Advanced Internship in Speech-Language Pathology V 1 (0-3) to 18 (0-54) May be repeated for credit. Prereq SHS 566, 575, by interview only. Advanced practicum in diagnosis of and therapy for communication disorders. SHS graduate student; all undergraduate prerequisite courses completed.

574 Neuropathologies of Language 3 Advanced study of language disorders resulting from brain insult after birth; emphasis on aphasia and related disorders. SHS graduate student; all undergraduate prerequisite courses completed.

575 Advanced Clinical Practice V 2 (0-6) to 6 (0-18) May be repeated for credit; cumulative maximum 15 hours. Prereq by interview only. Advanced clinical practice in evaluation and treatment of speech, language, and hearing disorders. SHS graduate student; all undergraduate prerequisite courses completed.

576 Voice Disorders 2 Functional and organic voice disorders resulting from various etiologies. SHS graduate student; all undergraduate prerequisite courses completed.

580 Special Topics in Speech and Hearing Sciences V 1-3 May be repeated for credit; cumulative maximum 9 hours. Advanced study of specialized topics in speech and hearing sciences. SHS graduate student; all undergraduate prerequisite courses completed.

582 Clinical Perspectives 3 Theory and clinical experience designed to assist students in integrating course work into a clinical perspective. SHS graduate student; all undergraduate prerequisite courses completed.

587 Speech-Language Pathology in the Medical Setting 2 Report writing and charting, collaborating with the medical team, establishing prognosis and assessing efficacy of treatment, and third-party reimbursement. SHS graduate student; all undergraduate prerequisite courses completed.

588 Phonological Acquisition and Behavior 3 Current literature in articulatory development and deviancy; diagnosis and therapy. SHS graduate student; all undergraduate prerequisite courses completed.

590 Special Topics in Speech and Hearing Sciences V 1-3 May be repeated for credit; cumulative maximum 9 hours. Advanced study of specialized topics in speech and hearing sciences. SHS graduate student; all undergraduate prerequisite courses completed.

600 Special Projects or Independent Study V 1-18 May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Speech and Hearing Sciences

Degree offered: Master of Arts in Speech and Hearing Sciences - Non Thesis

Program offered: Spokane

Degree Description

Academic coursework and clinical practicum offerings prepare students to become professional personnel capable of meeting the diagnostic and therapy needs of individuals of all ages evidencing a wide variety of speech, language, learning, and hearing problems.Students are prepared as speech-language pathologists to provide direct and consultative services in educational and medical settings. The course of study emphasizes physiological, behavioral, neurological, and psychological dimensions of normal development, fundamental communication processes, and disorders of communication.By applying science and research to clinical practice, graduate students develop proficiency in reasoning and problem-solving relative to clinical principles and procedures in diagnosis and treatment. The academic teaching and learning philosophy is student-centered, research-based, and writing intensive.Full-time students typically complete the program in approximately two years, carrying on average 12-16 credit hours per semester. To be accepted into the graduate program, one must have earned a bachelor's degree in the field of speech language pathology or communication disorders or have met the undergraduate prerequisites.To be accepted into the graduate program, one must have earned a bachelor's degree in the field of speech language pathology or communication disorders or have met the undergraduate prerequisites.The Postbaccalaureate Program, a specialized one-year course sequence, allows a student with a bachelor's degree in another field to prepare for entry to the master's degree program in Speech and Hearing Sciences.

Sports Management - Sport Management

Degree offered: Master of Arts in Education

Faculty working with graduate students: 3

Graduate students: 2

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal)

Deadline: Fall: January 10
Spring: September 1

Program Description

WSU's Educational Leadership program offers graduate studies at the masters and doctoral levels and administrator certification programs for the superintendent, residency principal, and residency program administrator certificates. The masters (M.A. and Ed.M.) and doctoral (Ed.D. and Ph.D.) degree programs offer specializations in K-12 educational leadership.Program faculty are dedicated to meeting students' needs as current and future K-12 educational leaders and to preparing future professors for work in academia. The program provides a balance and integration of practical experience, theory, and research and aims to prepare educational leaders who function as scholar-practitioners.Educational leadership programs are offered at all of WSU's campuses (Pullman, Spokane, Tri-Cities, and Vancouver). All campuses offer the Educational Leadership masters degrees, certification programs, and access to the statewide doctor of education degree (Ed.D.). One-year residency at the Pullman campus is required for the doctor of philosophy degree (Ph.D.).WSU's Educational Leadership program is one of 70 doctoral-granting programs nationwide selected for membership in the University Council for Educational Administration, a national consortium dedicated to the improvement of educational leadership preparation and practice. WSU's graduate students have the opportunity to participate in UCEA's annual convention and other professional activities.WSU's administrator certification programs are organized around the national ISLLC (Interstate School Leaders Licensure Consortium) standards, which have been adopted as the certification standards for Washington State licensure.. WSU's innovative cohort-based and field-based certification programs for principals and superintendents promote a close professional network. Faculty members for certification programs have extensive experience as school principals and/or central office administrators.

Degree Description

The Sport Management Program is committed to preparing students for careers as managers and administrators in the sports industry. Students examine the range of historical, social, legal, political, economic, and organizational issues that impact the management of sport in varied settings, including collegiate, recreational, and professional sport. Students who plan to work in the sport industry will typically choose the Ed.M. degree . The M.A. degree is recommended for students who might eventually pursue a doctoral degree, such as those interested in careers as college professors. Students interested in doctoral work in Sport Management may apply to WSU's doctoral program in Higher Education Administration and select a twelve-credit area of specialization comprised of courses offered by the Sport Management Program.

Post-Graduate Employment Opportunities

Jobs in sport industry sectors such as professional sport, collegiate sport, recreational sport, youth sport, and international sport, with careers in areas such as event management, sport marketing and promotion, sport journalism, media relations, athletics directors, recreation management, ticket sales; community relations, etc.

Post-Graduate Career Placements

Intercollegiate athletics departments (event management coordinator, marketing and promotions coordinator, medial relations coordinator, compliance coordinator; assistant director of athlete academic support services); professional sports teams (group sales account executive, corporate sponsorship assistant director, ticket office assistant director, assistant general manager); high school athletics director; assistant managers for golf and tennis clubs; championships assistant for intercollegiate athletics conference; assistant director for state high school athletic association; state director of tourism.

Contact Information

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Faculty

Cathryn Claussen, Tammy Crawford and John Wong.

ED AD

501 **Philosophy of Education** 3 Development of American educational philosophy.

503 **Values and Ethics for Educational Leaders** 3 Study of ethical theories, the moral dilemmas of public schooling, and the skills of ethical reasoning; professional code of ethics.

506 **Social Context of Education** 2 The interpretation of social context issues including historical, legal and cultural factors as these influence policies and practice in education.

507 **Social Foundations of Education** 3 Educational adaptations to the economic and social trends and forces.

510 **Improvement of Instruction** 3 Analysis and evaluation of instructional models with emphasis on information processing; implications for changing teaching style.

514 **Basic Principles of Curriculum Design** V 2-3 The application of theoretical concepts and approaches in the planning and design of curricula.

515 **Curriculum Implementation** 3 Research and practice; innovation and change in curricular organization emphasizing implementation.

516 Instructional and Curricular Leadership V 2-3 Theory, research, and practice of providing instructional and curricular leadership in schools and other educational settings.

518 Media Literacy and Educational Technology 3 Relates research and theory of media literacy to instructional resources and current leadership practices; problems of planning and administering programs.

520 Seminar in Curriculum and Instruction V 2-3 Contemporary issues, analyses and developments of educational programs.

521 Topics in Education V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and/or applications in selected areas of education.

522 Topics in Education V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and /or applications in selected areas of education.

531 Special Topics 1 May be repeated for credit; cumulative maximum 3 hours. Topical issues in education responding to shifting demands and skills needed by parents, teachers, school administrators and community leaders.

532 Special Topics 1 May be repeated for credit; cumulative maximum 3 hours. Topical issues in education responding to shifting demands and skills needed by parents, teachers, school administrators and community leaders.

534 Special Topics 1 May be repeated for credit; cumulative maximum 3 hours. Topical issues in education responding to shifting demands and skills needed by parents, teachers, school administrators and community leaders.

536 Introduction to Qualitative Research in Education 3 Prereq EdPsy 505. Introduction to the theory and methods of qualitative research; field relations, data collections, data analysis, hypothesis development, and theory generation.

537 Advanced Qualitative Research in Education 3 Prereq EdRes 564. Advanced theory and methods of qualitative research; theoretical foundations, data collection and analysis, and reporting.

538 Special Topics in Qualitative Research in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq Ed Ad 536. May be repeated for credit; cumulative maximum 6 hours.

560 Student Personnel Services in Higher Education 2 or 3 Philosophy, structure, functions, and organization of student affairs administration.

561 Introduction to College Student Development 3 Student development theory, related research and the application of theory to practice in student affairs work.

562 Professional Issues in Student Affairs Administration 3 Prereq Ed Ad 560, 561. The organization, programs and professional issues related to selected student affairs programs and units.

563 Research in College Student Development 3 Prereq Ed Ad 561. Critique, understand, and apply college social identity models as they relate to teaching, advising, and working with diverse student populations.

565 Practicum in Higher Education 3 (0-9) Prereq graduate student with 15 hours of completed course work in education. Selected supervised experiences in general higher education and student affairs settings provide for the investigation/application of theory/methods gained through formal course work.

567 Diversity in Higher Education 3 Prereq graduate standing. Reflection on experience and examination of the theory of practice or organizational leadership in the context of diversity.

568 Finance and Budgeting in Higher Education 3 Prereq undergraduate macro and microeconomics or by permission of instructor; graduate standing. Exposes students to the fundamentals of higher education budgeting and finance.

570 Community and Technical Colleges 3 For teachers and administrators. Development and function of community and technical colleges.

571 College Teaching 3 Concepts, principles, issues, and procedures in college curriculum development, and college teaching.

572 History of Higher Education 3 History, philosophy, objectives, and issues of colleges and universities as social institutions.

573 Issues in Higher Education 3 Selected contemporary issues in higher education.

578 Higher Education Law and Ethics 3 Legal and ethical aspects of higher education with special reference to administrators, faculty, and students in higher education institutions.

579 Administration of Higher Education 3 Organization, administration and leadership of universities, colleges, and community colleges.

580 School Organization and Administration 3 Readings and discussions on the theories and practices of school organization and administration.

581 Politics in Education 3 Prereq graduate standing. Examining the intrapersonal, organizational politics and political dilemma, particularly as they pertain to marginalized groups.

582 Policy Formation and Analysis in Education 3 Political and organizational policy formation processes in educational organizations; policy analysis in education.

583 Community and Communications 3 Social, political, and economic relationships between education and the community; methods of public polling and campaign strategy techniques.

584 Human Resource Management 3 Human relations in education; problems involved and practical solutions considered.

585 Financial Management in Education 3 Economics and financing of education; financial planning, budget development, investment analysis, bonding, cost effectiveness; current trends in educational finance.

587 Seminar in School Administration V 1-6 May be repeated for credit; cumulative maximum 6 hours. Interdisciplinary seminars; related studies; discussions in several areas by specialists.

588 The Law and Education 3 Fundamental legal principles within which public education functions; applicable school codes of Washington and other states; review important court cases.

589 Leadership Development Seminar 3 Improving knowledge and skills in strategic planning, decision making, leadership issues, conflict, motivation, staff development, productivity, and stress.

590 Internship V 3 (0-9) to 6 (0-18) May be repeated for credit; cumulative maximum 12 hours. By interview only. Internship in professional positions.

596 Preparing Grant Proposals 3 Identification of funding sources; analysis, evaluation, and production of grant proposals.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

EDPSY

502 Theoretical Foundations of Learning and Instruction 3 Historical and contemporary theories of learning and instruction: application of theory in counseling and teaching settings.

505 Research Methods I 3 Research methods; literature review; design, implementation, and interpretation of results.

508 Educational Statistics 3 Prereq EdPsy 505. Introductory course for graduate students in applied statistics for the behavioral sciences.

565 Quantitative Research 3 Prereq EdPsy 508; EdRes 563. Same as EdRes 565.

SPMGT

540 Current Issues in Sport Management 3 Solutions-oriented investigation of current issues faced by sport managers/administrators; interpretation of research literature; procedures for issue resolution.

573 Philosophical Perspectives of Sport and Physical Activity 3 Prereq SpMgt 365 or equivalent; or permission of instructor. Ontological, ethical, aesthetic views of physical activity.

574 Social and Cultural Issues of Physical Activity and Sport 3 Prereq SpMgt 367 or equivalent; or permission of instructor. Sport and physical activity as cultural forms, including the examination of subcultures, stratification, socialization and power relations.

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578 Sports in Society 3 Prereq SpMgt 367 or equivalent, or permission of instructor. The social significance of sports; sociology of sport research.

Sports Management - Sport Management

Degree offered: Master of Arts in Education - Non Thesis

Faculty working with graduate students: 4

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal)

Deadline: Fall: January 10
Spring: September 1

Requirements

None

Program Description

WSU's Educational Leadership program offers graduate studies at the masters and doctoral levels and administrator certification programs for the superintendent, residency principal, and residency program administrator certificates. The masters (M.A. and Ed.M.) and doctoral (Ed.D. and Ph.D.) degree programs offer specializations in K-12 educational leadership.Program faculty are dedicated to meeting students' needs as current and future K-12 educational leaders and to preparing future professors for work in academia. The program provides a balance and integration of practical experience, theory, and research and aims to prepare educational leaders who function as scholar-practitioners.Educational leadership programs are offered at all of WSU's campuses (Pullman, Spokane, Tri-Cities, and Vancouver). All campuses offer the Educational Leadership masters degrees, certification programs, and access to the statewide doctor of education degree (Ed.D.). One-year residency at the Pullman campus is required for the doctor of philosophy degree (Ph.D.).WSU's Educational Leadership program is one of 70 doctoral-granting programs nationwide selected for membership in the University Council for Educational Administration, a national consortium dedicated to the improvement of educational leadership preparation and practice. WSU's graduate students have the opportunity to participate in UCEA's annual convention and other professional activities.WSU's administrator certification programs are organized around the national ISLLC (Interstate School Leaders Licensure Consortium) standards, which have been adopted as the certification standards for Washington State licensure.. WSU's innovative cohort-based and field-based certification programs for principals and superintendents promote a close professional network. Faculty members for certification programs have extensive experience as school principals and/or central office administrators.

Degree Description

The Sport Management Program is committed to preparing students for careers as managers and administrators in the sports industry. Students examine the range of historical, social, legal, political, economic, and organizational issues that impact the management of sport in varied settings, including collegiate, recreational, and professional sport.

Training and Professional Development Opportunities

None

Post-Graduate Employment Opportunities

None

Post-Graduate Career Placements

None

Contact Information

Graduate Coordiantor
Office of Graduate Studies
Washington State University
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Pullman, WA 99163-2114
Telephone: 509-335-9195
Fax: 509-335-2097
E-mail: gradstudies@wsu.edu

Faculty

Justin Barnes, Cathryn Claussen, Tammy Crawford and John Wong.

ED AD

501 Philosophy of Education 3 Development of American educational philosophy.

503 Values and Ethics for Educational Leaders 3 Study of ethical theories, the moral dilemmas of public schooling, and the skills of ethical reasoning; professional code of ethics.

506 Social Context of Education 2 The interpretation of social context issues including historical, legal and cultural factors as these influence policies and practice in education.

507 Social Foundations of Education 3 Educational adaptations to the economic and social trends and forces.

510 Improvement of Instruction 3 Analysis and evaluation of instructional models with emphasis on information processing; implications for changing teaching style.

514 Basic Principles of Curriculum Design V 2-3 The application of theoretical concepts and approaches in the planning and design of curricula.

515 Curriculum Implementation 3 Research and practice; innovation and change in curricular organization emphasizing implementation.

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518 Media Literacy and Educational Technology 3 Relates research and theory of media literacy to instructional resources and current leadership practices; problems of planning and administering programs.

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536 Introduction to Qualitative Research in Education 3 Prereq EdPsy 505. Introduction to the theory and methods of qualitative research; field relations, data collections, data analysis, hypothesis development, and theory generation.

537 Advanced Qualitative Research in Education 3 Prereq EdRes 564. Advanced theory and methods of qualitative research; theoretical foundations, data collection and analysis, and reporting.

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560 Student Personnel Services in Higher Education 2 or 3 Philosophy, structure, functions, and organization of student affairs administration.

561 Introduction to College Student Development 3 Student development theory, related research and the application of theory to practice in student affairs work.

562 Professional Issues in Student Affairs Administration 3 Prereq Ed Ad 560, 561. The organization, programs and professional issues related to selected student affairs programs and units.

563 Research in College Student Development 3 Prereq Ed Ad 561. Critique, understand, and apply college social identity models as they relate to teaching, advising, and working with diverse student populations.

565 Practicum in Higher Education 3 (0-9) Prereq graduate student with 15 hours of completed course work in education. Selected supervised experiences in general higher education and student affairs settings provide for the investigation/application of theory/methods gained through formal course work.

567 Diversity in Higher Education 3 Prereq graduate standing. Reflection on experience and examination of the theory of practice or organizational leadership in the context of diversity.

568 Finance and Budgeting in Higher Education 3 Prereq undergraduate macro and microeconomics or by permission of instructor; graduate standing. Exposes students to the fundamentals of higher education budgeting and finance.

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580 School Organization and Administration 3 Readings and discussions on the theories and practices of school organization and administration.

581 Politics in Education 3 Prereq graduate standing. Examining the intrapersonal, organizational politics and political dilemma, particularly as they pertain to marginalized groups.

582 Policy Formation and Analysis in Education 3 Political and organizational policy formation processes in educational organizations; policy analysis in education.

583 Community and Communications 3 Social, political, and economic relationships between education and the community; methods of public polling and campaign strategy techniques.

584 Human Resource Management 3 Human relations in education; problems involved and practical solutions considered.

585 Financial Management in Education 3 Economics and financing of education; financial planning, budget development, investment analysis, bonding, cost effectiveness; current trends in educational finance.

587 Seminar in School Administration V 1-6 May be repeated for credit; cumulative maximum 6 hours. Interdisciplinary seminars; related studies; discussions in several areas by specialists.

588 The Law and Education 3 Fundamental legal principles within which public education functions; applicable school codes of Washington and other states; review important court cases.

589 Leadership Development Seminar 3 Improving knowledge and skills in strategic planning, decision making, leadership issues, conflict, motivation, staff development, productivity, and stress.

590 Internship V 3 (0-9) to 6 (0-18) May be repeated for credit; cumulative maximum 12 hours. By interview only. Internship in professional positions.

596 Preparing Grant Proposals 3 Identification of funding sources; analysis, evaluation, and production of grant proposals.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

EDPSY

502 Theoretical Foundations of Learning and Instruction 3 Historical and contemporary theories of learning and instruction: application of theory in counseling and teaching settings.

505 Research Methods I 3 Research methods; literature review; design, implementation, and interpretation of results.

508 Educational Statistics 3 Prereq EdPsy 505. Introductory course for graduate students in applied statistics for the behavioral sciences.

SPMGT

540 Current Issues in Sport Management 3 Solutions-oriented investigation of current issues faced by sport managers/administrators; interpretation of research literature; procedures for issue resolution.

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Sports Management - Sport Management

Degree offered: Master of Education

Faculty working with graduate students: 3

Graduate students: 12

Tests required: GRE (Combined), GRE (Quantitative), GRE (Verbal)

Deadline: Fall: January 10
Spring: September 1

Requirements

None

Program Description

WSU's Educational Leadership program offers graduate studies at the masters and doctoral levels and administrator certification programs for the superintendent, residency principal, and residency program administrator certificates. The masters (M.A. and Ed.M.) and doctoral (Ed.D. and Ph.D.) degree programs offer specializations in K-12 educational leadership.Program faculty are dedicated to meeting students' needs as current and future K-12 educational leaders and to preparing future professors for work in academia. The program provides a balance and integration of practical experience, theory, and research and aims to prepare educational leaders who function as scholar-practitioners.Educational leadership programs are offered at all of WSU's campuses (Pullman, Spokane, Tri-Cities, and Vancouver). All campuses offer the Educational Leadership masters degrees, certification programs, and access to the statewide doctor of education degree (Ed.D.). One-year residency at the Pullman campus is required for the doctor of philosophy degree (Ph.D.).WSU's Educational Leadership program is one of 70 doctoral-granting programs nationwide selected for membership in the University Council for Educational Administration, a national consortium dedicated to the improvement of educational leadership preparation and practice. WSU's graduate students have the opportunity to participate in UCEA's annual convention and other professional activities.WSU's administrator certification programs are organized around the national ISLLC (Interstate School Leaders Licensure Consortium) standards, which have been adopted as the certification standards for Washington State licensure.. WSU's innovative cohort-based and field-based certification programs for principals and superintendents promote a close professional network. Faculty members for certification programs have extensive experience as school principals and/or central office administrators.

Degree Description

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Post-Graduate Employment Opportunities

Jobs in sport industry sectors such as professional sport, collegiate sport, recreational sport, youth sport, and international sport, with careers in areas such as event management, sport marketing and promotion, sport journalism, media relations, athletics directors, recreation management, ticket sales; community relations, etc.

Post-Graduate Career Placements

Intercollegiate athletics departments (event management coordinator, marketing and promotions coordinator, medial relations coordinator, compliance coordinator; assistant director of athlete academic support services); professional sports teams (group sales account executive, corporate sponsorship assistant director, ticket office assistant director, assistant general manager); high school athletics director; assistant managers for golf and tennis clubs; championships assistant for intercollegiate athletics conference; assistant director for state high school athletic association; state director of tourism.

Contact Information

Graduate Coordinator
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Statistics

Degree offered: Master of Science in Statistics

Faculty working with graduate students: 15

Graduate students: 32

Graduate students receiving assistantships or scholarships: 18%

Tests required: GRE (Quantitative), GRE (Verbal), TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

Stat 443 as core course - not listed below - EconS 510 may be substituted.Oral Project Defense and Oral Final Test. A written report of the student's project is due to the committee two weeks before the student's scheduled final oral examination.

Program Description

Statistics is the science that deals with the collection, analysis, display, and interpretation of data. Statistics is an interdisciplinary, intercollegiate program that emphasizes the connection of statistics to its many areas of application, as well as the traditional connection to mathematics. The Department offers courses that provide training in the application of statistical methods to the the biological, physical, and social sciences, and the theory of statistical methods, probability, and statistical computing. Opportunities for individuals trained in statistics abound in business, industry, government and academia.

Degree Description

The degree program has two option areas: applied and theoretical. Courses are chosen from four field areas: *Advanced Theory and Stochastic Processes, *Linear Models and Multivariate Analysis, *Data Analysis, *and Econometrics and Time Series. For both options, the core requirements include Stat 443, 512, 530, 533, 556, at least one course in statistical computing, and a minimum of two credit hours of statistical consulting (Stat 590) spread over two semesters. The remainder of the 30 hours must include a total of at least 3 courses from 2 field areas, chosen from the following: *Advanced Theory and Stochastic Processes: Stat 542, 544, 548, or 549. *Linear Models and Multivariate Analysis: Stat 519, 520, 535. *Data Analysis: Stat 422, 428, 513, 514, 515, 518, 536, 547, 555, 572, or 573. *Econometrics and Time Series: Stat 516, 531, 552, 555, or 586. The final Master's oral exam is a two-hour oral exam conducted by the student's M.S. committee. The oral exam will consist of (i) a 30-minute presentation of the student's Master's project, (ii) a 15-minute period following the Master's project presentation for questions by the committee related to the results contained in the Master's project, and, (iii) a 75-minute period devoted to a comprehensive oral exam covering the material in Stat 443, Stat 512, Stat 530, Stat 533, Stat 556 as well as material covered in additional course work. The student is expected to be thoroughly familiar with a wide array of statistical concepts as contained in the list of topics and concepts obtained from the department.

Post-Graduate Employment Opportunities

Opportunities for individuals trained in statistics abound in business, industry, government and academia.

Post-Graduate Career Placements

pharmacy, banking, credit card companies, consulting, government agencies

Contact Information

Linda Bentley
Program Coordinator
Statistics
Washington State University
Neill Hall 413
Pullman, WA 99164-3144
Telephone: 509-335-8645
Fax: 509-335-8369
E-mail: bentley@wsu.edu

Faculty

Sung Ahn, J Alldredge, Robert Bendel, Lyle Broemeling, Nairanjana Dasgupta, Marc Evans, Stergios Fotopoulos, Michael Jacroux, Venkata Jandhyala, Harry Johnson, Thomas Marsh, R Mittelhammer, Francis Pascual, David Sclar and Ping Ye.

ECONS

510 **Statistics for Economists** 3 Prereq college calculus and matrix algebra. Statistical theory underlying econometric techniques utilized in quantitative analysis of problems in economics and finance.

511 **Econometrics I** 3 Prereq EconS 510. Single equation linear and nonlinear models; estimation, inference, finite and asymptotic properties, effects and mitigation of violations of classical assumptions.

512 **Econometrics II** 3 Prereq EconS 501; EconS 511. Econometric methods for systems estimation; simultaneous equations, discrete and limited dependent variable, panel data, and time series data.

513 **Econometrics III** 3 Prereq EconS 502; EconS 503; EconS 512. Linear and non-linear models and maximum likelihood estimation and inference; semi-parametric and parametric methods; limited dependent variable models.

514 **Econometrics IV** 3 Prereq EconS 502; EconS 503; EconS 513. Constrained estimation, testing hypotheses, bootstrap resampling, BMM estimation and inference, nonparametric regression analysis, and an introduction to Bayesian econometrics.

MGTOP

516 **Time Series** 3 Prereq MgtOp 515 or Stat 443. ARIMA models; identification, estimation, diagnostics, and forecasting; seasonal adjustments, outlier detection, intervention analysis and transfer function modeling.

519 **Applied Multivariate Analysis** 3 Prereq MgtOp 591 or Stat 443. Principal components, factor analysis, discriminant function, cluster analysis, multivariate normal distribution, Hotelling's T2 and MANOVA.

STAT

443 **Applied Probability** 3 Prereq Math 172; 220. Axioms of probability theory; random variables; expectation; generating function; law of large numbers; central limit theorem; Markov chains.

507 **Experimental Design** 3 Prereq Stat 512. Methods of constructing and analyzing designs for experimental investigations; analysis of designs with unequal subclass numbers; concepts of blocking randomization and replication; confounding in factorial experiments; incomplete block designs; response surface methodology.

508 **Environmental Spatial Statistics** 3 (2-2) Prereq Stat 412. Same as SoilS 508.

510 **Topics in Probability and Statistics** 3 May be repeated for credit; cumulative maximum 6 hours. Prereq one 3 hour statistics course. Graduate-level counterpart of Stat 410; additional requirements. Credit not granted for both Stat 410 and 510.

512 **Statistical Methods in Research II** 3 (2-2) Prereq Stat 412 or equivalent. Analysis and interpretation of designed experiments: CRD, RCBD, spit-plot and repeated measures, multiple comparisons, multiple regression modeling, validation of assumptions.

514 **Nonparametric Statistics** 3 Prereq Stat 512. Conceptual development of nonparametric methods including one, two, and k-sample tests for location and scale, randomized complete blocks, rank correlation, and runs test; power, sample size, efficiency, and ARE.

516 **Time Series** 3 Prereq MgtOp 515 or Stat 443. Same as MgtOp 516.

519 **Applied Multivariate Analysis** 3 Prereq MgtOp 591 or Stat 443. Same as MgtOp 519.

520 **Statistical Analysis of Qualitative Data** 3 Prereq Math 140, 171, 201, 202, or 220; and one 3 hour statistics course. Binomial, Poisson, multinomial distribution; contingency tables, Fisher's tests, log-linear models; ordinal data; applications in biology, business, psychology, and sociology.

522 **Biostatistics and Statistical Epidemiology** 3 Prereq Math 171 or 220; Stat 412. Rigorous approach to biostatistical and epidemiological methods including relative risk, odds ratio, cross-over designs, survival analysis and generalized linear models.

523 **Statistical Methods for Engineers and Scientists** 3 Prereq Stat 360 or one 3 hour statistics course. Graduate-level counterpart of Stat 423; additional requirements. Credit not granted for both Stat 423 and 523.

530 **Applied Linear Models** 3 (2-2) Prereq Stat 360 or 412. The design and analysis of experiments by linear models.

533 **Theory of Linear Models** 3 Prereq Math 420, Stat 430, or 456. Theoretical basis of linear regression and analysis of variance models; a unified approach based upon the generalized inverse.

535 **Regression Analysis** 3 Prereq Stat 430 or 456. Conceptual development of regression; estimation, prediction, tests of hypotheses, variable selection, diagnostics, model validation, correlation, and nonlinear regression.

536 **Statistical Computing** 3 (2-3) Prereq (Stat 443 and 530), Stat 523, or by instructor's permission. Generation of random variables, Monte Carlo simulation, bootstrap and jackknife methods, EM algorithm, Markov chain Monte Carlo methods.

544 **Applied Stochastic Processes** 3 Prereq Stat 430 or 443. Poisson and Markov processes; queuing theory; auto-covariance; stationarity; power spectra; harmonic analysis; linear mean-square predictions.

548 **Statistical Theory I** 3 Prereq Math 273; Stat 430 or 443. Probability spaces, combinatorics, multidimensional random variables, characteristic function, special distributions, limit theorems, stochastic processes, order statistics.

549 **Statistical Theory II** 3 Prereq Stat 548. Continuation of Stat 548. Statistical inferences; estimation and testing hypotheses; regression analysis; sequential analysis and nonparametric methods.

555 **Statistical Ecology** 3 Prereq Stat 443. Stochastic models in ecological work; discrete and continuous statistical distributions, birth-death processes, diffusion processes; applications in population dynamics, population genetics, ecological sampling, spatial analysis, and conservation biology. (Spring, Alt/yrs).

556 **Introduction to Statistical Theory** 3 Prereq Stat 430 or 443; graduate standing. Graduate-level counterpart of Stat 456; additional requirements. Credit not granted for both Stat 456 and 556.

565 **Analyzing Microarray and Other Genomic Data** 3 Prereq Math 220; Stat 412 or 423. Statistical issues from pre-processing (transforming, normalizing) and analyzing genomic data (differential expression, pattern discovery and predictions).

572 **Quality Control** 3 Prereq Stat 360 or 443. Simple quality assurance tools; process monitoring; Shewhart control charts; process characterization and capability; sampling inspection; factorial experiments.

573 **Reliability** 3 Prereq Stat 360, 430, or 443. Probabilistic modeling and inference; product-limit estimator; probability plotting; maximum likelihood estimation with censored data; regression models for accelerated life testing.

590 **Statistical Consulting Practicum** V 1-2 May be repeated for credit; cumulative maximum 6 hours. Prereq Stat 512; Stat 530. Theory and practice of statistical consulting, participation in consulting session.

600 **Special Projects or Independent Study** V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 **Master's Special Problems, Directed Study, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

Statistics

Degree offered: Master of Science in Statistics - Minor

Program Description

Statistics is the science that deals with the collection, analysis, display, and interpretation of data. Statistics is an interdisciplinary, intercollegiate program that emphasizes the connection of statistics to its many areas of application, as well as the traditional connection to mathematics. The Department offers courses that provide training in the application of statistical methods to the the biological, physical, and social sciences, and the theory of statistical methods, probability, and statistical computing. Opportunities for individuals trained in statistics abound in business, industry, government and academia.

Degree Description

To receive a minor in Statistics a student completes 15 graded credit hours and a faculty member from Statistics sits as a fourth faculty on their committee.

Statistics

Degree offered: Master of Science in Statistics - Non Thesis

Faculty working with graduate students: 15

Graduate students: 32

Graduate students receiving assistantships or scholarships: 18%

Tests required: GRE (Quantitative), GRE (Verbal), TOEFL

Deadline: Fall: January 10
Spring: July 1

Requirements

2 hours oral defense of project and oral final test, Students earn a M.S. in statistics by completing 26 graded credit hours and 4 non-graded credit hours. Students complete a project in conjunction with their committee chair, turn in a paper on the project two weeks before their oral exams.

Program Description

Statistics is the science that deals with the collection, analysis, display, and interpretation of data. Statistics is an interdisciplinary, intercollegiate program that emphasizes the connection of statistics to its many areas of application, as well as the traditional connection to mathematics. The Department offers courses that provide training in the application of statistical methods to the the biological, physical, and social sciences, and the theory of statistical methods, probability, and statistical computing. Opportunities for individuals trained in statistics abound in business, industry, government and academia.

Degree Description

Statistics is the science that deals with the collection, analysis, display, and interpretation of data. Statistics is an interdisciplinary, intercollegiate program that emphasizes the connection of statistics to its many areas of application, as well as the traditional connection to mathematics. The Department offers courses that provide training in the application of statistical methods to the the biological, physical, and social sciences, and the theory of statistical methods, probability, and statistical computing. Opportunities for individuals trained in statistics abound in business, industry, government and academia.

Post-Graduate Employment Opportunities

pharmacy, banking, credit card companies, consulting, government agencies

Faculty

Sung Ahn, J Alldredge, Robert Bendel, Lyle Broemeling, Nairanjana Dasgupta, Marc Evans, Stergios Fotopoulos, Michael Jacroux, Venkata Jandhyala, Harry Johnson, Thomas Marsh, R Mittelhammer, Francis Pascual, David Sclar and Ping Ye.

ECONS

510 **Statistics for Economists** 3 Prereq college calculus and matrix algebra. Statistical theory underlying econometric techniques utilized in quantitative analysis of problems in economics and finance.

511 **Econometrics I** 3 Prereq EconS 510. Single equation linear and nonlinear models; estimation, inference, finite and asymptotic properties, effects and mitigation of violations of classical assumptions.

512 **Econometrics II** 3 Prereq EconS 501; EconS 511. Econometric methods for systems estimation; simultaneous equations, discrete and limited dependent variable, panel data, and time series data.

513 **Econometrics III** 3 Prereq EconS 502; EconS 503; EconS 512. Linear and non-linear models and maximum likelihood estimation and inference; semi-parametric and parametric methods; limited dependent variable models.

514 **Econometrics IV** 3 Prereq EconS 502; EconS 503; EconS 513. Constrained estimation, testing hypotheses, bootstrap resampling, BMM estimation and inference, nonparametric regression analysis, and an introduction to Bayesian econometrics.

MGTOP

516 **Time Series** 3 Prereq MgtOp 515 or Stat 443. ARIMA models; identification, estimation, diagnostics, and forecasting; seasonal adjustments, outlier detection, intervention analysis and transfer function modeling.

519 **Applied Multivariate Analysis** 3 Prereq MgtOp 591 or Stat 443. Principal components, factor analysis, discriminant function, cluster analysis, multivariate normal distribution, Hotelling's T2 and MANOVA.

STAT

443 Applied Probability 3 Prereq Math 172; 220. Axioms of probability theory; random variables; expectation; generating function; law of large numbers; central limit theorem; Markov chains.

507 Experimental Design 3 Prereq Stat 512. Methods of constructing and analyzing designs for experimental investigations; analysis of designs with unequal subclass numbers; concepts of blocking randomization and replication; confounding in factorial experiments; incomplete block designs; response surface methodology.

508 Environmental Spatial Statistics 3 (2-2) Prereq Stat 412. Same as SoilS 508.

510 Topics in Probability and Statistics 3 May be repeated for credit; cumulative maximum 6 hours. Prereq one 3 hour statistics course. Graduate-level counterpart of Stat 410; additional requirements. Credit not granted for both Stat 410 and 510.

512 Statistical Methods in Research II 3 (2-2) Prereq Stat 412 or equivalent. Analysis and interpretation of designed experiments: CRD, RCBD, spit-plot and repeated measures, multiple comparisons, multiple regression modeling, validation of assumptions.

514 Nonparametric Statistics 3 Prereq Stat 512. Conceptual development of nonparametric methods including one, two, and k-sample tests for location and scale, randomized complete blocks, rank correlation, and runs test; power, sample size, efficiency, and ARE.

516 Time Series 3 Prereq MgtOp 515 or Stat 443. Same as MgtOp 516.

519 Applied Multivariate Analysis 3 Prereq MgtOp 591 or Stat 443. Same as MgtOp 519.

520 Statistical Analysis of Qualitative Data 3 Prereq Math 140, 171, 201, 202, or 220; and one 3 hour statistics course. Binomial, Poisson, multinomial distribution; contingency tables, Fisher's tests, log-linear models; ordinal data; applications in biology, business, psychology, and sociology.

522 Biostatistics and Statistical Epidemiology 3 Prereq Math 171 or 220; Stat 412. Rigorous approach to biostatistical and epidemiological methods including relative risk, odds ratio, cross-over designs, survival analysis and generalized linear models.

523 Statistical Methods for Engineers and Scientists 3 Prereq Stat 360 or one 3 hour statistics course. Graduate-level counterpart of Stat 423; additional requirements. Credit not granted for both Stat 423 and 523.

530 Applied Linear Models 3 (2-2) Prereq Stat 360 or 412. The design and analysis of experiments by linear models.

533 Theory of Linear Models 3 Prereq Math 420, Stat 430, or 456. Theoretical basis of linear regression and analysis of variance models; a unified approach based upon the generalized inverse.

535 Regression Analysis 3 Prereq Stat 430 or 456. Conceptual development of regression; estimation, prediction, tests of hypotheses, variable selection, diagnostics, model validation, correlation, and nonlinear regression.

536 Statistical Computing 3 (2-3) Prereq (Stat 443 and 530), Stat 523, or by instructor's permission. Generation of random variables, Monte Carlo simulation, bootstrap and jackknife methods, EM algorithm, Markov chain Monte Carlo methods.

544 Applied Stochastic Processes 3 Prereq Stat 430 or 443. Poisson and Markov processes; queuing theory; auto-covariance; stationarity; power spectra; harmonic analysis; linear mean-square predictions.

548 Statistical Theory I 3 Prereq Math 273; Stat 430 or 443. Probability spaces, combinatorics, multidimensional random variables, characteristic function, special distributions, limit theorems, stochastic processes, order statistics.

549 Statistical Theory II 3 Prereq Stat 548. Continuation of Stat 548. Statistical inferences; estimation and testing hypotheses; regression analysis; sequential analysis and nonparametric methods.

555 Statistical Ecology 3 Prereq Stat 443. Stochastic models in ecological work; discrete and continuous statistical distributions, birth-death processes, diffusion processes; applications in population dynamics, population genetics, ecological sampling, spatial analysis, and conservation biology. (Spring, Alt/yrs).

556 Introduction to Statistical Theory 3 Prereq Stat 430 or 443; graduate standing. Graduate-level counterpart of Stat 456; additional requirements. Credit not granted for both Stat 456 and 556.

565 Analyzing Microarray and Other Genomic Data 3 Prereq Math 220; Stat 412 or 423. Statistical issues from pre-processing (transforming, normalizing) and analyzing genomic data (differential expression, pattern discovery and predictions).

572 Quality Control 3 Prereq Stat 360 or 443. Simple quality assurance tools; process monitoring; Shewhart control charts; process characterization and capability; sampling inspection; factorial experiments.

573 Reliability 3 Prereq Stat 360, 430, or 443. Probabilistic modeling and inference; product-limit estimator; probability plotting; maximum likelihood estimation with censored data; regression models for accelerated life testing.

590 Statistical Consulting Practicum V 1-2 May be repeated for credit; cumulative maximum 6 hours. Prereq Stat 512; Stat 530. Theory and practice of statistical consulting, participation in consulting session.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Supply Chain Management - Cert in Supply Chain Management

Degree offered: Graduate Certificate in Supply Chain Management

Graduate students: 5

Program offered: DDP

Deadline: Fall: July 15 (January 10 international)
Spring: November 15 (July 1 international)

Requirements

Student will apply to receive the certificate and pay the fee in first half of the final semster.

Program Description

The ETM Certificate Program allows students to complete shorter professional blocks of coursework relevant to their specific needs. Rather than completing all the course requirements for an ETM master's degree, students may take four courses (12-credit hours) in specialized areas. A certificate is awarded upon completion of these courses. Course credits earned for a certificate may also apply to a master's degree in the ETM Program or other graduate degree programs. A student may earn more than one certificate and may work

on the certificate and master's program concurrently. Eight certificates are available in the Master of Engineering and Technology Management degree program.

Degree Description

Every organization has internal supply chains, and links to external suppliers and customers. Interlinking organizations span the spectrum from raw materials to finished products and services in the hands of the consumer. The supply chain extends even to final disposition of the commodities we consume from concept to grave. The structured dependency of such chains, the uncertainty of forecasts and systemic delays are amplified as individual links in the supply chain try to optimize their performance. Even minor changes in the market can cause wild swings in economic performance. Modern design for manufacturability, six sigma quality, operation theories, information systems, such as ERP systems, and theory of constraints hold the promise of stabilizing some of the variability by providing visibility along the whole supply chain. Additional control and operational performance factors are needed to provide a complete solution. This course examines the strategy and tactics of supply chain management to include "how to" techniques to implement, measure and reward the individual links in the supply chain.

Contact Information

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Dr. Bill Gray
Faculty
ETM
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Engineering Management

E M

530 **Applications of Constraints Management** 3 Graduate-level counterpart of E M 430; additional requirements. Credit not granted for both E M 430 and 530.

555 **Enterprise Resource Management** 3 Prereq graduate standing. Focusing the flow of quality, timely products and cooperative supply chain operations and planning using simulation and effective enterprise resource management.

560 **Integrated Supply Chain Management** 3 How technical managers analyze and manage the flow of materials, services, and information for products from inception to final customer.

570 **Six Sigma Quality Management** 3 Prereq graduate standing. Graduate-level counterpart of E M 470; additional requirements. Credit not granted for both E M 470 and 570.

590 **Design for Product and Service Realization** 3 Prereq graduate standing. Same as E M 490; additional requirements. Credit not granted for both E M 490 and 590.

Sustainable Agriculture - Cert in Sustainable Agriculture

Degree offered: Graduate Certificate in Sustainable Agriculture

Faculty working with graduate students: 4

Graduate students: 5

Graduate students receiving assistantships or scholarships: 80%

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Program Description

The Graduate Certificate in Sustainable Agriculture provides post-baccalaureate students with an interdisciplinary understanding of practices and current issues in sustainable agriculture, along with the science that makes it work. Students who earn this certificate may take these skills into all industries and agencies involved in the food chain; from production, processing, and delivery to policy, regulation, education, and research. Students in any graduate program are eligible for the certificate if they meet the prerequisites of the courses needed for the certificate. Non-degree-seeking students may also complete the certificate if they are accepted to the WSU Graduate School.

Degree Description

The Graduate Certificate in Sustainable Agriculture requires a minimum of 9 graded credits. Two core courses provide 6 credits, and 3 credits must be earned from courses in relevant disciplines outside the student's primary degree program. No more than 3 of the graded credits toward the certificate may be undergraduate credits. Certificate Core (6 credits) â– AFS 501: Current Research in Organic and Sustainable Agriculture (3 credits) â– AFS 545: Field Analysis of Sustainable Food Systems (3 credits) Scientific Breadth Component (3 credits) Because sustainable agriculture is inherently interdisciplinary, the Breadth Component ensures that students gain knowledge of a relevant discipline outside their primary degree department. The student is required to complete at least 3 graded credits in disciplines other than the home department. The course(s) must be clearly and directly relevant to the practice or understanding of sustainable agriculture.

Training and Professional Development Opportunities

none

Post-Graduate Employment Opportunities

The Graduate Certificate in Sustainable Agriculture increases knowledge and employment potential in any position focused on sustainability. This will include educational, commercial, and research endeavors for production, processing, or policy.

Post-Graduate Career Placements

Agricultural Research AssociateCounty Agricultural Extension Agent

Contact Information

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Academic Coordinator
Crop and Soil Sciences
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E-mail: marshdj@wsu.edu

Dr. Lynne Carpenter-Boggs
BIOAg Research Leader
Center for Sustaining Agriculture & Natural Resources
Johnson 227
Pullman, WA 99164-6420
Telephone: 509-335-1553
E-mail: lcboggs@wsu.edu

Faculty

Preston Andrews, Lynne Carpenter-Boggs, William Pan and William Snyder.

Animal Sciences

A S

313 **Feeds and Feeding** 4 (3-3) Prereq Biol 106. Utilization, practices, requirements, nutritive characteristics, and calculations of rations for animals. Field trip required.

360 **Meat Science** 3 (2-3) Prereq Biol 107. Anatomy, slaughter, classification, and processing of meat animal species. Special clothing and equipment required.

378 **Advanced Livestock and Meat Selection and Evaluation** 2 (0-6) May be repeated for credit. Prereq A S 260. Principles and practices of livestock and meat selection and evaluation. Off-campus and weekend participation required.

408 **Ruminant Nutrition** 3 Prereq A S 313. Anatomy, physiology, and metabolism in ruminant animals.

468 **Concepts in Aquaculture** 3 (2-3) Prereq NATRS 421, or permission of instructor. Same as NATRS 424.

472 Dairy Cattle Management 3 Prereq A S 313; A S 330; A S 350. Principles of breeding, feeding, and management of dairy cattle. Field trip required.

473 Advanced Dairy Management 3 (1-6) Prereq A S 472. Current dairy record keeping and database management systems.

474 Beef Cattle Production 3 (2-3) Prereq A S 313; A S 330; A S 350. Breeding, feeding, and management; commercial and purebred enterprises; management of beef cattle on ranges, pastures and in the feedlot. Field trip required.

476 Sheep Science 3 (2-3) Prereq A S 313; A S 330; A S 350. Application of principles of genetics, reproduction, nutrition, health, marketing to management; and use of wool.

478 Swine Production 3 (2-3) Prereq A S 313; A S 330; A S 350. Principles of breeding, feeding, management, and marketing of swine. Field trips and special clothing required.

Agricultural And Food Systems

AFS

501 Current Research in Organic and Sustainable Agriculture 3 Multidisciplinary framework to assess the sustainability of a range of farming and food systems.

545 Field Analysis of Sustainable Food Systems 3 Graduate-level counterpart of AFS 445; additional requirements. Credit not granted for both AFS 445 and 545.

Agricultural And Food Systems

AGTM

305 Agricultural Precision Systems 3 (2-3) Prereq junior standing or permission of instructor. Systems for precision agriculture, equipment, software uses, principles, construction, care, tillage, planting, spraying, harvesting, and materials handling machinery. Field trips required.

405 Advanced Agricultural Precision Systems 2 (1-3) Prereq AgTM 305 or instructor approval. Advanced principles of precision agricultural systems, software uses, management of controllers on equipment, geographical information systems and global positioning systems.

505 Precision Agricultural Systems Management 3 Prereq admission to graduate program. Evolving technologies involved in precision agriculture and their application to agricultural systems.

Agricultural And Food Systems

BIOL

420 Plant Physiology 3 Prereq Biol 106 or 120; Water relations, mineral nutrition, photosynthesis, respiration, and growth of plants.

421 Plant Physiology Laboratory 1 (0-3) Prereq Biol 420 or c//. Laboratory for Biol 420.

Agricultural And Food Systems

BSYSE

557 Nutrient Cycling and Transport 3 Cycling of carbon, nitrogen and phosphorus at global and watershed scales; modeling of transportation and transport in agricultural systems

564 Agricultural Waste and Air Quality Management 3 Detailed analyses of agricultural wastes and their potential adverse impacts on the environment; current management systems; reuse and recycle.

Agricultural And Food Systems

CROPS

302 Forage Crops 3 (2-3) Prereq Biol 106 or 120. Adaptation, production, and utilization of forage crops. Field trip required.

305 Ecology and Management of Weeds 3 (2-3) Prereq Biol 106; Biol 120; CropS/Hort 102; CropS/Hort 202. Weed ecology/management in crop and non-crop systems; weed growth/development, identification, weed control (chemical, mechanical, biological), and environmental issues

360 World Agricultural Systems 3 Prereq two semesters physical or biological sciences. Study of agro-environmental characteristics of world agriculture; historical and contemporary features of world food production.

403 Advanced Cropping Systems 3 Prereq CropS 201; Pl P 429 or c//; or graduate standing. Understanding the management of constraints to crop production and quality; biological, physical, and chemical approaches to crop health management. Field trips required. Credit not granted for both CropS 403 and 503.

443 Plant Breeding for Organic Agriculture 3 Prereq Crops/Hort 202; Biol 106 or 120. Concepts and practice of breeding in and for organic agriculture with an emphasis on field-based, on-farm techniques.

503 Advanced Cropping Systems 3 Prereq CropS 201; Pl P 429 or c//; or graduate standing. Graduate-level counterpart of CropS 403; additional requirements. Credit not granted for both CropS 403 and 503.

513 Biology of Weeds 3 Prereq graduate standing. Biology, ecology, and physiology of weeds; crop and weed interactions and interference.

Community And Rural Sociology

CRS

336 Agriculture, Environment and Community 3 Prereq Prereq 3 credits S or K GER; sophomore standing. Examines interdependencies between farming/ranching, the natural environment and human communities including perspectives on sustainable agriculture.

416 Sustainable Small Farming and Ranching Overview 3 Introduction to small acreage production systems, evaluation of personal and family goals, land evaluation, business planning, marketing options, regulations, and community resources. Cooperative course taught by UI (Ag 404), open to WSU students.

417 Agricultural Entrepreneurship 3 Designed for students who are interested in starting an agricultural enterprise or gaining knowledge of the process.

441 Local Impacts of Global Commodity Systems 3 Prereq 6 credits S or K GER; junior standing. Theories of globalization, its social, political and economic dimensions, and its impact on people and communities. Credit not granted for both CRS 441 and 541.

541 Local Impacts of Global Commodity Systems 3 Prereq graduate standing. Graduate-level counterpart of CRS 441; additional requirements. Credit not granted for both CRS 441 and 541.

590 Sociology of Agriculture and Food Systems 3 Theories, concepts, debates and methods associated with the sociology of agriculture and food systems.

Community And Rural Sociology

ENTOM

340 Agricultural Entomology 3 (2-3) Prereq Biol 106, 107. Control, identification, and biology of insects and related arthropods. Course equivalent to OSU's Ent 311 and UI's Ent 322.

343 General Entomology 3 Biology, natural history, and importance of insects and related arthropods.

350 Pest Management in Organic Agriculture Production Systems 2 Prereq general biology or ecology. Principles, methodologies and implementation of arthropod pest suppression in organic cropping systems.

361 Honey Bee Biology 3 Biology of the honey bee, including behavior, genetics, evolution, pollination, sociality, and beekeeping practices.

447 Fundamentals of Biological Control 3 Intro to history and development of biological control and biological and ecological factors involved; emphasis on entomophagous and phytophagous insects. For graduate credit, students present a paper or "grant proposal" for critique. (Alt/yrs). Credit not granted for both Entom 447 and 547.

547 Fundamentals of Biological Control 3 Intro to history and development of biological control and biological and ecological factors involved; emphasis on entomophagous and phytophagous insects. For graduate credit, students present a paper or "grant proposal" for critique. (Alt/yrs). Credit not granted for both Entom 447 and 547.

Environmental Science & Regional Planning

ES/RP

410 Global Biogeochemistry 3 Prereq Chem 106 with a C or better. Cycles of biogeochemically important elements and anthropogenic changes to those cycles in terrestrial and aquatic environments on a global scale. Field trip required. Credit not granted for both ES/RP 410 and 510.

Environmental Science & Regional Planning

HORT

310 Pomology 3 Prereq biological or plant science course. History, botany, cultivation and uses of temperate-zone tree fruits.

313 Viticulture and Small Fruits 3 Prereq biological science, botany, plant science course, or Hort/CropS 202. Botanical relationships, plant characteristics, fruiting habits, location, culture, marketing, and utilization of grapes, berries, and other small or bush fruits. Field trip required.

320 Olericulture 3 Prereq Hort 202. Science, business, and art of vegetable crop production: culture, fertility, growth, physiology, handling, marketing; garden, commercial, greenhouse, tropical, specialty vegetables.

321 Olericulture Laboratory 1 (0-3) Prereq c// in Hort 320. Production principles and practices of vegetable crops; plant characteristics, cultivars, nutrition, growth, and development. Field trip required.

421 Fruit Crops Management 3 Prereq woody horticultural crop production, a plant physiology course. Management strategies for the efficient production and marketing of temperate-zone fruit crops. Credit not granted for both Hort 421 and 521.

521 Fruit Crops Management 3 Prereq woody horticultural crop production, a plant physiology course. Graduate-level counterpart of Hort 421; additional requirements. Credit not granted for both Hort 421 and 521.

Integrated Pest Management

IPM

462 Systems of Integrated Pest Management 3 (2-3) Utilization of the systems approach in agricultural pest management; design, implementation, and analysis of IPM programs for selected crops.

Natural Resource Sciences

NATRS

455 Elements of Range Management Sciences 3 Prereq Biol 107. Systems science, ecology, wildlife, livestock, social science, concept design, and their contributions to a management science involving rangelands.

556 Foraging Ecology of Herbivores 2 Prereq graduate student or by permission. Synthesis of foraging behavior concepts including nutritive quality of forages, digestive and metabolic constraints, and diet and habitat selection.

Natural Resource Sciences

PL P

300 Diseases of Fruit Crops 2 Prereq Biol 120, Hort 310, or Hort 313. Comprehensive understanding of the diseases of fruit crops grown in the state of Washington.

429 General Plant Pathology 3 (2-3) Classification, symptoms, causes, epidemiology, and control of plant diseases.

525 Field Plant Pathology and Mycology V 1 (0-3) to 2 (0-6) May be repeated for credit; cumulative maximum 4 hours. Field trips, forays, and demonstrations dealing with various aspects of plant pathology and mycology.

551 Epidemiology and Management of Plant Diseases 3 Prereq Pl P 429 or 529. Principles of plant disease epidemiology, control and ecology of pathogens.

Natural Resource Sciences

SOILS

301 Ecological Soil Management 3 Prereq SoilS 201. Soil and water conservation and management; land classification and reclamation; soils and environmental quality; sustainable agroecosystems.

302 Introduction of Agroecology 3 Prereq SoilS 201 Agroecological crop production through case study analyses and applications of ecological principles in traditional and modern farming systems.

360 World Agricultural Systems 3 Prereq two semesters physical or biological sciences. Same as CropS 360.

441 Soil Fertility 3 Prereq SoilS 201. Nutrient management impacts on crop productivity, soil and water quality; mineral requirements; soil testing; plant analysis; inorganic and organic fertilizers.

480 Practicum in Organic Agriculture V 1 (0-3) to 6 (0-18) May be repeated for credit; cumulative maximum 12 hours. Prereq by permission. Applied principles and practices of organic agriculture; immersion and participation in all required farming/gardening activities.

499 Special Problems V 1 (0-3) to 4 (0-12) May be repeated for credit.

502 Advanced Topics in Soils V 1-3 May be repeated for credit; cumulative maximum 6 hours. Interpretation, presentation, and discussion of current research on soils, uses, and management.

547 Soil Fertility Management 3 Prereq SoilS 441. Philosophy of fertilizer recommendations based on soil and plant tissue testing; principles of fertilizer manufacture, placement and use.

Systems Engineering Management - Cert in Systems Eng Management

Degree offered: Graduate Certificate in Systems Engineering Management

Graduate students: 5

Program offered: DDP

Deadline: Fall: July 15 (January 10 international)
Spring: November 15 (July 1 international)
Summer: April 1 (Default international)

Requirements

Student will apply for the certificate in the final semester.

Program Description

The ETM Certificate Program allows students to complete shorter professional blocks of coursework relevant to their specific needs. Rather than completing all the course requirements for an ETM master's degree, students may take four courses (12-credit hours) in specialized areas. A certificate is awarded upon completion of these courses. Course credits earned for a certificate may also apply to a master's degree in the ETM Program or other graduate degree programs. A student may earn more than one certificate and may work on the certificate and master's program concurrently. Eight certificates are available in the Master of Engineering and Technology Management degree program.

Degree Description

The complexity of modern systems and projects has demonstrated that it is no longer possible to rely on design evolution and associated tools to improve and develop a system. To address this complexity, system engineering has evolved along with new methods and modeling techniques to better comprehend engineering systems as they grow more complex. System engineering is a holistic, robust approach to the design, creation and operation of systems. It consists of identification and quantification of system goals, creation of alternative system design concepts, performance of trade studies, selection and identification of the best design, verification that the design is properly built and integrated, and post implementation assessment of how well the system meets the customer goals and needs. The system engineering method deals with systems as an integrated whole comprised of diverse subsystems and functions and works to optimize overall system functions and achieve maximum compatibility of its elements. This course focuses on how complex engineering projects should be managed over the life cycle of the project. It deals with the work processes and tools to handle large scale complex engineering projects in a sustainable environment and overlaps with the technical and human disciplines characteristic of these projects.

Contact Information

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Engineering Management

E M

505 Finance for Technical Systems 3 Time value of money, capital budgeting, accounting principles, cost, valuation, risk, cost accounting and sensitivity analyses: concepts for engineering decision-making.

526 Constraints Management 3 Graduate-level counterpart of E M 426; additional requirements. Credit not granted for both E M 426 and 526.

545 Technical Decision Analysis 3 Prereq basic stats course; graduate standing. Decision analysis provides a structured discipline for describing, analyzing, and finalizing decisions involving uncertainty.

564 Project Management 3 Planning, organizing, scheduling and controlling major projects; human dimensions, PERT and CPM scheduling models, resource allocation, and cost controls. Credit not granted for both E M 464 and 564.

565 Introduction to Systems Management 3 Prereq graduate standing. Design manufacture, operation of complex system development for engineering managers; project planning, organizing, and controlling tools for engineering system constraints.

566 System Engineering Analysis and Practice 3 Prereq graduate standing. Problem-solving methodologies based on system concepts and design applications for complex, large-scale technical systems pertinent to program managers.

590 Design for Product and Service Realization 3 Prereq graduate standing. Same as E M 490; additional requirements. Credit not granted for both E M 490 and 590.

Teaching and Learning - Cultural Studies and Social Thought in Education

Degree offered: Doctor of Philosophy (Education)

Faculty working with graduate students: 5

Graduate students: 20

Graduate students receiving assistantships or scholarships: 75%

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10

Program Description

Our mission is to advance knowledge and ethical practice in the field of education. We do so through collaboration among universities, schools, families, and local, regional and global communities in a manner that reflects the ideals of democracy, social justice, and ecological sustainability.In brief, we offer teacher certification in elementary education (bachelor of arts in education, master in teaching) and secondary education (degree from major plus certification, master in teaching), and additional endorsements. We also offer professional certification, as well as a master of education (Ed.M.)and master of arts in education (M.A.) degrees. At the doctoral level, we offer two Pullman-based degrees. Those are the doctor of education(Ed.D.) in teacher leadership and the doctor of philosophy (Ph.D.) in education with specializations in cultural studies and social thought in education, language and literacy education, and special education.The research of our faculty contributes knowledge to our undergraduate and graduate programs and to the field of education in general.Our programs rely heavily on research-based, theoretical frameworks and the close connections we maintain with classroom teachers and other practitioners. We stress active engagement, critical problem-solving, and equity/fairness for all learners.

Degree Description

The Cultural Studies and Social Thought in Education (CSSTE) Ph.D. option is a rigorous, flexible, and individually-tailored course of study that focuses on the issues of culture and power in the contemporary and historical contexts of education. Cultural studies includes popular culture and media, social justice, environment, ethics, aesthetics, race, ethnicity, gender, and social class, which are applied to a range of educational sub-fields that include literacy, educational leadership, teacher leadership, school reform, curriculum theory, higher education, science, art, special education, and bilingual/ELL (English Language Learners). The overall goal of the faculty is to articulate a cohesive and supportive community of educational scholarship and practice. While coursework is important, we work to establish a strong program of mentorship in which doctoral candidates

are mentored into the world of research, knowledge generation and dissemination, and pedagogical and social action. We are committed to the idea that our scholarly endeavors stimulate positive change in schools and the communities and society those schools serve. Education, whether it takes place in the formal settings of schools and museums or the informal contexts of home and the movie theater, is defined by its cultural context. Cultural studies take these cultural contexts as the essential starting point to build research projects and define teaching practices.

Post-Graduate Employment Opportunities

University faculty in cultural studies, social foundations, or related fields; administrator or researcher in a school district or state/national educational organization or non-profit or non-governmental organization.

Post-Graduate Career Placements

Assistant Professor, Eastern Washington UniversityAcademic Counselor, Eastern Washington University Assistant Professor, Northern Illinois University. Assistant Professor, University of PortlandAssistant Professor, California State University at Stanislaus.Assistant Professor, Gonzaga UniversityClimate Change Adaptation Coordinator for the Province of Alberta

Contact Information

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E-mail: gradstudies@wsu.edu

Faculty

Pamela Bettis, Michael Hayes, Paula Price, Pauline Sameshima and Dawn Shinew.

EDRES

562 Epistemology, Inquiry, and Representation 3 Prereq doctoral standing; EdPsy 505 or c//. Epistemological assumptions and methodological strategies of research.

563 Principles of Research 3 Prereq CoPsy 501 or EdRes 562 . The centrality of literature review and the understanding of methods used in educational research; practice in designing research questions.

564 Qualitative Research 3 Prereq EdRes 563. Theoretical underpinnings of qualitative research; familiarity with published qualitative research in education; practical research skills.

565 Quantitative Research 3 Prereq EdPsy 508; EdRes/EdPsy 563. Statistical literacy in educational research; parametric and non-parametric methods.

566 Research Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Prereq doctoral student. Presentation and analysis of research; professional development in research presentation.

Teaching And Learning

T & L

501 Bilingual/ESL Education 3 May be repeated for credit; cumulative maximum 6 hours. Work with students from diverse linguistic and cultural backgrounds in educational settings.

502 Assessment for Teaching and Learning V 2-3 Instruction in sound assessment practices for preservice and inservice graduate students.

503 ESL Methods and Material for Secondary Content Teachers 2 Research-based ESL strategies and methods for pre-service and secondary content area teachers.

504 Advanced Study in Linguistics for Educators 3 Prereq admission to T & L graduate program. Use of linguistics to better understand second language learning and teaching and the physical aspects of acquiring a language.

505 ESL Methods for General Educators (K-8) 2 Research-based ESL strategies and methods for pre-service and experienced teachers.

506 Multicultural Classroom Instruction and Management 4 Instructional and management strategies for maximizing students' opportunities to learn in a multicultural setting.

507 Seminar in Literacy in Multicultural Settings I 3 Multicultural perspective to curriculum development and classroom literacy practices.

508 Seminar in Literacy in Multicultural Settings II 3 Prereq T & L 507. Multicultural perspective to curriculum development and classroom literacy practices.

509 Research in Curriculum and Assessment for Bilingual/ESL Education 3 Prereq T & L 510 or 549. Research in curriculum development for and assessment of language minority students.

510 Theoretical Foundations of Bilingual/ESL Education 3 Prereq either T & L 333, T & L 335, or T & L 413. Graduate-level counterpart of T & L 410; additional requirements. Credit not granted for both T & L 410 and 510.

512 Language and Cultural Factors in Mathematics 3 Prereq graduate standing. Research and instructional strategies related to linguistic and cultural influences on learning math.

513 Seminar in Middle School Education 3 For experienced teachers. Curriculum patterns and recent research regarding instruction and materials in the contemporary middle school.

514 Methods and Materials for Bilingual/ESL Education 3 Prereq T & L 510 or T & L 549. For pre-service and experienced teachers. Graduate-level counterpart of T & L 414; additional requirements. Credit not granted for both T & L 414 and 514.

515 The Education of Cultural and Linguistic Minority Students 3 Issues in the education of language minority students.

516 Advanced Study in Computer-Assisted Language Learning 3 Prereq T & L 510 or T & L 549. Research, theory, and practice in computer-assisted language learning.

517 Educational Technology in K-8 Schools 2 (1-2) Prereq admission to MIT program. Technology standards for teachers, technology use in schools, production techniques and instructional methods.

518 Integrating Technology into the Curriculum 3 Examination and articulation of the potential for new technologies to expand learning opportunities.

519 Instructional Media Production I 3 Instructional media development, emphasizing the theory and methods of instructional design, digital media production and evaluation.

520 Topics in Special Student Populations V 1-4 May be repeated for credit; cumulative maximum 6 hours. For K-12 teachers. Knowledge of special student populations and guidance in developing appropriate curricula.

521 Topics in Education V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and/or applications in selected areas of education.

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525 Classroom Management Seminar V 2-3 Contemporary issues in management of elementary, middle school, and secondary classrooms; issues of abuse.

526 Research in Multicultural Education 3 Prereq either T & L 515 or by permission. Research and instructional practices focusing on multicultural education.

527 Seminar in Teacher Education Instruction 1 May be repeated for credit; cumulative maximum 4 hours. Teacher preparation program components and rationale, university teaching strategies, and evaluation methods.

528 Literacy within the Disciplines 3 Explores literacy research and practices that enhance the learning of various disciplines taught in K-12 settings.

529 Place-Based Education 3 Theory and practice of place-based education with an emphasis on community-based action research and curriculum planning.

530 Innovations in Reading 2 or 3 Graduate-level counterpart of T & L 431; additional requirements. Credit not granted for both T & L 431 and 530.

532 Children's Literature in the Curriculum 2 Theory and classroom applications for selecting and using literature and storytelling in content areas; reading, writing, language development, the arts.

533 Middle Level Mathematics Pedagogy and Philosophy 3 Middle-school philosophy; understanding of effective standards and research-based instructional methods.

535 Gender, Power and Education 3 Interdisciplinary focus on the relationships among gender, power and education.

536 Cultural Studies in Education 3 Historical and conceptual background of the field of cultural studies.

537 Seminar in Language, Literacy, and Culture 3 Interrelationships between schools, literacy, and student cultural background.

538 Writing Across the Curriculum 3 Writing for learning at grade levels K-12.

539 Innovations in Language Arts 3 The most recent developments in language arts instruction for pre-service and in-service teachers K-12.

540 Elementary School Social Studies 3 For candidates admitted to graduate teacher preparation and experienced teachers. Elementary structures of various social sciences; research findings related to instruction; classroom applications and materials.

541 Teacher Professional Certification: Pre-Assessment Seminar V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of ProCert application, Provisional Status/Employer Support verification (WAC 180-78A-505), and a copy of Residency Teaching Certificate. Candidates evaluate current teaching against standards to determine steps for professional growth plans which measure positive impact on student learning.

542 Teacher Professional Certification: Researching Exemplary Practices V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of T&L 541: Pre-Assessment Seminar. Teachers will apply exemplary practices, continue to assess their performance and college evidence of positive impact on student learning.

543 Teacher Professional Certification: Culminating Seminar V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of T & L 541(Pre-Assessment Seminar), Professional Growth Record initial activities approved, completed core credits, and Evidence/Artifacts gathered. Candidates will complete ProCert requirements to document positive impact on students' learning: set new goals; learn about National Board options.

544 Advanced Children's Literature 3 Trends, issues, and research in children's literature.

546 Teaching Writing in the Elementary School 3 Theory and research relevant to instructional approaches and practices for teaching writing in elementary schools.

547 Teaching Folk Literature to Children and Adolescents 3 Folk literature as a genre in child and adolescent literature; curriculum applications; reading, language development, social studies, creative expression.

548 Teaching Adolescent Literature 3 Evaluating, selecting, and using literature for middle school and teenage students.

549 Communicating in a Multilingual Society 3 Prereq T & L 333, T & L 335, T & L 413 or graduate standing. Study of language in social and educational context and its relation to cultural and linguistic diversity.

550 Second Language Learning and Literacy 3 Prereq admission to doctoral program. Research on second language teaching and learning in literacy education with a focus on English language learners in US schools.

551 Psychology of Reading V 2-3 Psychological, perceptual, motivational, developmental and physiological aspects of reading.

552 Literacy Development I 3 For candidates admitted to graduate teacher preparation. Review of current research and approaches to instruction in the development of literacy in elementary and middle grades.

553 Assessment and Instruction for Reading: K-8 4 (3-3) Prereq T & L 307; T & L 321; T & L 322; T & L 551. Evaluation techniques and instructional practices for impacting the reading achievement of K-8 students.

554 Sociolinguistics 3 Prereq doctoral student. Interaction between language use and sociopolitical and cultural contexts; cultural and linguistic delivery and educational opportunity.

555 Seminar in Literacy Development 3 May be repeated for credit; cumulative maximum 6 hours. Current and historical research in reading/language arts, infancy through college and adult years; papers presented by faculty, invited speakers, and students.

556 Literacy Development II 3 Prereq for candidates admitted to graduate teacher preparation. Review of current research and approaches to instruction in the development of literacy in elementary and middle grades.

557 Research in Reading 3 Prereq EdPsy 505. Exploration of qualitative and quantitative reading research covering topics of current and historical importance.

558 Improving Comprehension through Literature 3 Key theoretical concepts and their implications for improved comprehension instruction, using children's literature.

559 Readings in Cultural Studies and Social Thought in Education 1 May be repeated for credit; cumulative maximum 3 hours. Current scholarship in the field of cultural studies in education and practices of schools.

560 Research in Teaching 3 May be repeated for credit; cumulative maximum 6 hours. Recent developments in research on teaching; both quantitative and qualitative research methodologies emphasized.

561 Elementary School Mathematics 3 Research on curriculum and instruction issues in elementary school mathematics.

564 Elementary School Mathematics Methods 3 For candidates admitted to graduate teacher preparation. Introduction to research, theory, and methods of teaching K-8 mathematics; emphasis on integrating theory and practice.

565 Introduction to Scholarly Inquiry 1 Prereq graduate standing. Introduction to the Ed.M program including the scholarship and research requirements and the role of students and action research.

566 Democratic Education 3 Prereq graduate standing. Rationale and skill to assist teachers in making classrooms more democratic.

567 Social Foundations of Literacy 3 Prereq admission to doctoral program. Social, cultural and political factors which influence the acquisition and use of literacy.

568 Psychological Foundations and Assessment of Literacy 3 Prereq admission to doctoral program. Historical look that blends the assessment of literacy and its psychological components.

569 Critical Analysis of Children's and Young Adult Literature 3 Prereq doctoral student. Multicultural analysis of children's and adolescent literature and its pedagogical and sociopolitical implications and possibilities.

570 Theory and Research in Electronic Literacies 3 . Ideas of literacy and effects of technology on literacy and policy, particularly those issues addressing diverse learners.

571 Elementary School Science 3 Prereq for candidates admitted to graduate teacher preparation. Theories and research underlying science programs with classroom implications.

572 Elementary School Science Methods 3 For candidates admitted to graduate teacher preparation. Theoretical base to design and implement appropriate standards-based elementary science instruction.

574 Science for All: An Individual and Multicultural Perspective 3 Prereq for candidates admitted to graduate teacher preparation. Implications of cultural and individual diversity for understanding western scientific and mathematical thought; an activity-based, educational perspective.

575 Globalization and Identity in Education 3 Issues relating to the complexities of globalization and identity in education.

576 Youth Cultures in Education 3 Analysis of how youth cultures operate in society and how they are practiced in schools.

577 Curriculum Theory 3 Curriculum theory as the interdisciplinary study of educational experience.

580 Multicultural Education in a Global Society 3 Graduate-level counterpart of T & L 480; additional requirements. Credit not granted for both T & L 480 and 580.

583 Problem Solving in Elementary and Middle Level Education 3 For candidates admitted to graduate teacher preparation. Integration of knowledge and skills to address complex cases in teaching and learning.

587 Environment, Culture and Education 3 Prereq graduate standing. Role of education in the social, ecological, and political conflicts between culture and environment.

588 Action Research: Teachers as Research 3 Theoretical concepts, research, issues, models, and strategies for implementation of action research.

589 Race, Identity and Representation in Education 3 Interdisciplinary research in race, identity and representations in education.

590 Internship V 2 (0-2) to 6 (0-18) May be repeated for credit; cumulative maximum 12 hours. By interview only. Opportunities in professional positions.

592 Social Theory in Education 3 Prereq doctoral student. Social theory and how it applies to intellectual work in education.

593 Pre-internship and Seminar 2 (1-3) Instructional practice in diverse classroom settings and reflection on that practice.

594 Integrating Fine Arts into K-8 Curriculum 2 Integrating Fine Arts (art, music, dance, drama) into K-8 curriculum; designed for pre-service MIT.

595 Internship and Seminar 10 (1-27) Instructional practice in classroom settings, reflection on practice; professional certification.

596 Topics in In-Service Education V 1-3 May be repeated for credit; cumulative maximum 12 hours. Prereq graduate standing or permission of instructor. Advanced study of research, practice, and contemporary issues in education.

597 Topics in In-Service Education V 1-3 May be repeated for credit; cumulative maximum 9 hours. New developments and applications on selected in-service and staff development topics.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Teaching and Learning - Curriculum and Instruction

Degree offered: Doctor of Education

Faculty working with graduate students: 6

Deadline: Fall: January 10
Spring: September 1

Program Description

Our mission is to advance knowledge and ethical practice in the field of education. We do so through collaboration among universities, schools, families, and local, regional and global communities in a manner that reflects the ideals of democracy, social justice, and ecological sustainability.In brief, we offer teacher certification in elementary education (bachelor of arts in education, master in teaching) and secondary education (degree from major plus certification, master in teaching), and additional endorsements. We also offer professional certification, as well as a master of education (Ed.M.)and master of arts in education (M.A.) degrees. At the doctoral level, we offer two Pullman-based degrees. Those are the doctor of education(Ed.D.) in teacher leadership and the doctor of philosophy (Ph.D.) in education with specializations in cultural studies and social thought in education, language and literacy education, and special education.The research of our faculty contributes knowledge to our undergraduate and graduate programs and to the field of education in general.Our programs rely heavily on research-based, theoretical frameworks and the close connections we main-

tain with classroom teachers and other practitioners. We stress active engagement, critical problem-solving, and equity/fairness for all learners.

Degree Description

The Curriculum and Instruction specialization offers graduate studies at the master's and doctoral degree levels. The specialization offers students rigorous and individually tailored programs of study. The Ed.D.* is designed to develop K-12 teachers, administrators, and researchers for intellectual leadership and practice in classrooms, schools, districts, agencies, and colleges/universities. Through research, students in Curriculum and Instruction generate applicable knowledge as well as practical recommendations and solutions for complex educational challenges.

Training and Professional Development Opportunities

None

Post-Graduate Employment Opportunities

None

Post-Graduate Career Placements

None

Contact Information

Graduate Coordiantor
Office of Graduate Studies
Washington State University
Cleveland Hall 252
PO Box 642114
Pullman, WA 99163-2114
Telephone: 509-335-9195
Fax: 509-335-2097
E-mail: gradstudies@wsu.edu

Faculty

Gisela Ernst-Slavit, Janet Frost, Eric Johnson, Tonda Liggett, Paula Price and Richard Sawyer.

ED AD

514 Basic Principles of Curriculum Design V 2-3 The application of theoretical concepts and approaches in the planning and design of curricula.

522 Topics in Education V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and /or applications in selected areas of education.

EDPSY

570 Introduction to Program Evaluation 3 Prereq EdPsy 505. Introduction to strategies and techniques for evaluation of educational and social programs.

EDRES

563 Principles of Research 3 Prereq CoPsy 501 or EdRes 562 . The centrality of literature review and the understanding of methods used in educational research; practice in designing research questions.

564 Qualitative Research 3 Prereq EdRes 563. Theoretical underpinnings of qualitative research; familiarity with published qualitative research in education; practical research skills.

565 Quantitative Research 3 Prereq EdPsy 508; EdRes/EdPsy 563. Statistical literacy in educational research; parametric and non-parametric methods.

SP ED

589 Seminar in Disability Studies 3 Current research, issues, trends in disabilities within the broader context of education, society, history.

Teaching And Learning

T & L

501 Bilingual/ESL Education 3 May be repeated for credit; cumulative maximum 6 hours. Work with students from diverse linguistic and cultural backgrounds in educational settings.

502 Assessment for Teaching and Learning V 2-3 Instruction in sound assessment practices for preservice and inservice graduate students.

503 ESL Methods and Material for Secondary Content Teachers 2 Research-based ESL strategies and methods for pre-service and secondary content area teachers.

504 Advanced Study in Linguistics for Educators 3 Prereq admission to T & L graduate program. Use of linguistics to better understand second language learning and teaching and the physical aspects of acquiring a language.

505 ESL Methods for General Educators (K-8) 2 Research-based ESL strategies and methods for pre-service and experienced teachers.

506 Multicultural Classroom Instruction and Management 4 Instructional and management strategies for maximizing students' opportunities to learn in a multicultural setting.

507 Seminar in Literacy in Multicultural Settings I 3 Multicultural perspective to curriculum development and classroom literacy practices.

508 Seminar in Literacy in Multicultural Settings II 3 Prereq T & L 507. Multicultural perspective to curriculum development and classroom literacy practices.

509 Research in Curriculum and Assessment for Bilingual/ESL Education 3 Prereq T & L 510 or 549. Research in curriculum development for and assessment of language minority students.

510 Theoretical Foundations of Bilingual/ESL Education 3 Prereq either T & L 333, T & L 335, or T & L 413. Graduate-level counterpart of T & L 410; additional requirements. Credit not granted for both T & L 410 and 510.

512 Language and Cultural Factors in Mathematics 3 Prereq graduate standing. Research and instructional strategies related to linguistic and cultural influences on learning math.

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595 Internship and Seminar 10 (1-27) Instructional practice in classroom settings, reflection on practice; professional certification.

596 Topics in In-Service Education V 1-3 May be repeated for credit; cumulative maximum 12 hours. Prereq graduate standing or permission of instructor. Advanced study of research, practice, and contemporary issues in education.

597 Topics in In-Service Education V 1-3 May be repeated for credit; cumulative maximum 9 hours. New developments and applications on selected in-service and staff development topics.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Teaching and Learning - Curriculum and Instruction

Degree offered: Master of Education

Faculty working with graduate students: 8

Graduate students: 69

Program offered: Pullman, Spokane, Tri-Cities, Vancouver

Deadline: Fall: January 10
Spring: July 1

Requirements

None

Program Description

Our mission is to advance knowledge and ethical practice in the field of education. We do so through collaboration among universities, schools, families, and local, regional and global communities in a manner that reflects the ideals of democracy, social justice, and ecological sustainability.In brief, we offer teacher certification in elementary education (bachelor of arts in education, master in teaching) and secondary education (degree from major plus certification, master in teaching), and additional endorsements. We also offer professional certification, as well as a master of education (Ed.M.)and master of arts in education (M.A.) degrees. At the doctoral level, we offer two Pullman-based degrees. Those are the doctor of education(Ed.D.) in teacher leadership and the doctor of philosophy (Ph.D.) in education with specializations in cultural studies and social thought in education, language and literacy education, and special education.The research of our faculty contributes knowledge to our undergraduate and graduate programs and to the field of education in general.Our programs rely heavily on research-based, theoretical frameworks and the close connections we maintain with classroom teachers and other practitioners. We stress active engagement, critical problem-solving, and equity/fairness for all learners.

Degree Description

The Curriculum and Instruction specialization offers graduate studies at the master's and doctoral degree levels. The specialization offers students rigorous and individually tailored programs of study. The Ed.D.* is designed to develop K-12 teachers, administrators, and researchers for intellectual leadership and practice in classrooms, schools, districts, agencies, and colleges/universities. Through research, students in Curriculum and Instruction generate applicable knowledge as well as practical recommendations and solutions for complex educational challenges. The M.A. and Ed.M. degree programs are designed for students with bachelor degrees who have an interest in deepening their knowledge in a specific content area (in or outside the College of Education) as well as educational research in curriculum and instruction. The master's degree programs also emphasize applying research, theory, and evidence-based practices to improve education. This specialization is designed especially for secondary teachers who wish to take courses in their teaching field as well as advanced coursework in teaching and learning.

Post-Graduate Employment Opportunities

Teachers, program coordinators

Post-Graduate Career Placements

InstructorsTeachers

Contact Information

Graduate Coordinator
Office of Graduate Studies
Washington State University
Cleveland Hall 252
PO Box 642114
Pullman, WA 99164-2114
Telephone: 509-335-9195
Fax: 509-335-2097
E-mail: gradstudies@wsu.edu

Faculty

Tariq Akmal, Pamela Bettis, Janet Frost, Leslie Hall, Jo Olson, Paula Price, Pauline Sameshima and Dawn Shinew.

ED AD

501 **Philosophy of Education** 3 Development of American educational philosophy.

507 **Social Foundations of Education** 3 Educational adaptations to the economic and social trends and forces.

510 **Improvement of Instruction** 3 Analysis and evaluation of instructional models with emphasis on information processing; implications for changing teaching style.

514 **Basic Principles of Curriculum Design** V 2-3 The application of theoretical concepts and approaches in the planning and design of curricula.

536 **Introduction to Qualitative Research in Education** 3 Prereq EdPsy 505. Introduction to the theory and methods of qualitative research; field relations, data collections, data analysis, hypothesis development, and theory generation.

580 **School Organization and Administration** 3 Readings and discussions on the theories and practices of school organization and administration.

582 **Policy Formation and Analysis in Education** 3 Political and organizational policy formation processes in educational organizations; policy analysis in education.

EDPSY

502 **Theoretical Foundations of Learning and Instruction** 3 Historical and contemporary theories of learning and instruction: application of theory in counseling and teaching settings.

505 **Research Methods I** 3 Research methods; literature review; design, implementation, and interpretation of results.

508 **Educational Statistics** 3 Prereq EdPsy 505. Introductory course for graduate students in applied statistics for the behavioral sciences.

SP ED

501 **Teaching Students with Disabilities** 3 Prereq either Sp Ed 301, Sp Ed 420/520 or c//; c// in Sp Ed 590 for 2 credits. Graduate-level counterpart of Sp Ed 401; additional requirements. Credit not granted for both Sp Ed 401 and 501.

520 **Teaching in Inclusive Classrooms** V 2-3 Graduate-level counterpart of Sp Ed 420; additional requirements. Credit not granted for both Sp Ed 420 and 520.

Teaching And Learning

T & L

501 **Bilingual/ESL Education** 3 May be repeated for credit; cumulative maximum 6 hours. Work with students from diverse linguistic and cultural backgrounds in educational settings.

502 **Assessment for Teaching and Learning** V 2-3 Instruction in sound assessment practices for preservice and inservice graduate students.

503 **ESL Methods and Material for Secondary Content Teachers** 2 Research-based ESL strategies and methods for pre-service and secondary content area teachers.

504 **Advanced Study in Linguistics for Educators** 3 Prereq admission to T & L graduate program. Use of linguistics to better understand second language learning and teaching and the physical aspects of acquiring a language.

505 **ESL Methods for General Educators (K-8)** 2 Research-based ESL strategies and methods for pre-service and experienced teachers.

506 **Multicultural Classroom Instruction and Management** 4 Instructional and management strategies for maximizing students' opportunities to learn in a multicultural setting.

507 **Seminar in Literacy in Multicultural Settings I** 3 Multicultural perspective to curriculum development and classroom literacy practices.

508 Seminar in Literacy in Multicultural Settings II 3 Prereq T & L 507. Multicultural perspective to curriculum development and classroom literacy practices.

509 Research in Curriculum and Assessment for Bilingual/ESL Education 3 Prereq T & L 510 or 549. Research in curriculum development for and assessment of language minority students.

510 Theoretical Foundations of Bilingual/ESL Education 3 Prereq either T & L 333, T & L 335, or T & L 413. Graduate-level counterpart of T & L 410; additional requirements. Credit not granted for both T & L 410 and 510.

512 Language and Cultural Factors in Mathematics 3 Prereq graduate standing. Research and instructional strategies related to linguistic and cultural influences on learning math.

513 Seminar in Middle School Education 3 For experienced teachers. Curriculum patterns and recent research regarding instruction and materials in the contemporary middle school.

514 Methods and Materials for Bilingual/ESL Education 3 Prereq T & L 510 or T & L 549. For pre-service and experienced teachers. Graduate-level counterpart of T & L 414; additional requirements. Credit not granted for both T & L 414 and 514.

515 The Education of Cultural and Linguistic Minority Students 3 Issues in the education of language minority students.

516 Advanced Study in Computer-Assisted Language Learning 3 Prereq T & L 510 or T & L 549. Research, theory, and practice in computer-assisted language learning.

517 Educational Technology in K-8 Schools 2 (1-2) Prereq admission to MIT program. Technology standards for teachers, technology use in schools, production techniques and instructional methods.

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521 Topics in Education V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and/or applications in selected areas of education.

522 Topics in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

523 Topics in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

524 Topics in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

525 Classroom Management Seminar V 2-3 Contemporary issues in management of elementary, middle school, and secondary classrooms; issues of abuse.

526 Research in Multicultural Education 3 Prereq either T & L 515 or by permission. Research and instructional practices focusing on multicultural education.

527 Seminar in Teacher Education Instruction 1 May be repeated for credit; cumulative maximum 4 hours. Teacher preparation program components and rationale, university teaching strategies, and evaluation methods.

528 Literacy within the Disciplines 3 Explores literacy research and practices that enhance the learning of various disciplines taught in K-12 settings.

529 Place-Based Education 3 Theory and practice of place-based education with an emphasis on community-based action research and curriculum planning.

530 Innovations in Reading 2 or 3 Graduate-level counterpart of T & L 431; additional requirements. Credit not granted for both T & L 431 and 530.

532 Children's Literature in the Curriculum 2 Theory and classroom applications for selecting and using literature and storytelling in content areas; reading, writing, language development, the arts.

533 Middle Level Mathematics Pedagogy and Philosophy 3 Middle-school philosophy; understanding of effective standards and research-based instructional methods.

535 Gender, Power and Education 3 Interdisciplinary focus on the relationships among gender, power and education.

536 Cultural Studies in Education 3 Historical and conceptual background of the field of cultural studies.

537 Seminar in Language, Literacy, and Culture 3 Interrelationships between schools, literacy, and student cultural background.

538 Writing Across the Curriculum 3 Writing for learning at grade levels K-12.

539 Innovations in Language Arts 3 The most recent developments in language arts instruction for pre-service and in-service teachers K-12.

540 Elementary School Social Studies 3 For candidates admitted to graduate teacher preparation and experienced teachers. Elementary structures of various social sciences; research findings related to instruction; classroom applications and materials.

541 Teacher Professional Certification: Pre-Assessment Seminar V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of ProCert application, Provisional Status/Employer Support verification (WAC 180-78A-505), and a copy of Residency Teaching Certificate. Candidates evaluate current teaching against standards to determine steps for professional growth plans which measure positive impact on student learning.

542 Teacher Professional Certification: Researching Exemplary Practices V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of T&L 541: Pre-Assessment Seminar. Teachers will apply exemplary practices, continue to assess their performance and college evidence of positive impact on student learning.

543 Teacher Professional Certification: Culminating Seminar V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of T & L 541(Pre-Assessment Seminar), Professional Growth Record initial activities approved, completed core credits, and Evidence/Artifacts gathered. Candidates will complete ProCert requirements to document positive impact on students' learning: set new goals; learn about National Board options.

544 Advanced Children's Literature 3 Trends, issues, and research in children's literature.

546 Teaching Writing in the Elementary School 3 Theory and research relevant to instructional approaches and practices for teaching writing in elementary schools.

547 Teaching Folk Literature to Children and Adolescents 3 Folk literature as a genre in child and adolescent literature; curriculum applications; reading, language development, social studies, creative expression.

548 Teaching Adolescent Literature 3 Evaluating, selecting, and using literature for middle school and teenage students.

549 Communicating in a Multilingual Society 3 Prereq T & L 333, T & L 335, T & L 413 or graduate standing. Study of language in social and educational context and its relation to cultural and linguistic diversity.

550 Second Language Learning and Literacy 3 Prereq admission to doctoral program. Research on second language teaching and learning in literacy education with a focus on English language learners in US schools.

551 Psychology of Reading V 2-3 Psychological, perceptual, motivational, developmental and physiological aspects of reading.

552 Literacy Development I 3 For candidates admitted to graduate teacher preparation. Review of current research and approaches to instruction in the development of literacy in elementary and middle grades.

553 Assessment and Instruction for Reading: K-8 4 (3-3) Prereq T & L 307; T & L 321; T & L 322; T & L 551. Evaluation techniques and instructional practices for impacting the reading achievement of K-8 students.

554 Sociolinguistics 3 Prereq doctoral student. Interaction between language use and sociopolitical and cultural contexts; cultural and linguistic delivery and educational opportunity.

555 Seminar in Literacy Development 3 May be repeated for credit; cumulative maximum 6 hours. Current and historical research in reading/language arts, infancy through college and adult years; papers presented by faculty, invited speakers, and students.

556 Literacy Development II 3 Prereq for candidates admitted to graduate teacher preparation. Review of current research and approaches to instruction in the development of literacy in elementary and middle grades.

557 Research in Reading 3 Prereq EdPsy 505. Exploration of qualitative and quantitative reading research covering topics of current and historical importance.

558 Improving Comprehension through Literature 3 Key theoretical concepts and their implications for improved comprehension instruction, using children's literature.

559 Readings in Cultural Studies and Social Thought in Education 1 May be repeated for credit; cumulative maximum 3 hours. Current scholarship in the field of cultural studies in education and practices of schools.

560 Research in Teaching 3 May be repeated for credit; cumulative maximum 6 hours. Recent developments in research on teaching; both quantitative and qualitative research methodologies emphasized.

561 Elementary School Mathematics 3 Research on curriculum and instruction issues in elementary school mathematics.

564 Elementary School Mathematics Methods 3 For candidates admitted to graduate teacher preparation. Introduction to research, theory, and methods of teaching K-8 mathematics; emphasis on integrating theory and practice.

565 Introduction to Scholarly Inquiry 1 Prereq graduate standing. Introduction to the Ed.M program including the scholarship and research requirements and the role of students and action research.

566 Democratic Education 3 Prereq graduate standing. Rationale and skill to assist teachers in making classrooms more democratic.

567 Social Foundations of Literacy 3 Prereq admission to doctoral program. Social, cultural and political factors which influence the acquisition and use of literacy.

568 Psychological Foundations and Assessment of Literacy 3 Prereq admission to doctoral program. Historical look that blends the assessment of literacy and its psychological components.

569 Critical Analysis of Children's and Young Adult Literature 3 Prereq doctoral student. Multicultural analysis of children's and adolescent literature and its pedagogical and sociopolitical implications and possibilities.

570 Theory and Research in Electronic Literacies 3 . Ideas of literacy and effects of technology on literacy and policy, particularly those issues addressing diverse learners.

571 Elementary School Science 3 Prereq for candidates admitted to graduate teacher preparation. Theories and research underlying science programs with classroom implications.

572 Elementary School Science Methods 3 For candidates admitted to graduate teacher preparation. Theoretical base to design and implement appropriate standards-based elementary science instruction.

574 Science for All: An Individual and Multicultural Perspective 3 Prereq for candidates admitted to graduate teacher preparation. Implications of cultural and individual diversity for understanding western scientific and mathematical thought; an activity-based, educational perspective.

575 Globalization and Identity in Education 3 Issues relating to the complexities of globalization and identity in education.

576 Youth Cultures in Education 3 Analysis of how youth cultures operate in society and how they are practiced in schools.

577 Curriculum Theory 3 Curriculum theory as the interdisciplinary study of educational experience.

580 Multicultural Education in a Global Society 3 Graduate-level counterpart of T & L 480; additional requirements. Credit not granted for both T & L 480 and 580.

583 Problem Solving in Elementary and Middle Level Education 3 For candidates admitted to graduate teacher preparation. Integration of knowledge and skills to address complex cases in teaching and learning.

587 Environment, Culture and Education 3 Prereq graduate standing. Role of education in the social, ecological, and political conflicts between culture and environment.

588 Action Research: Teachers as Research 3 Theoretical concepts, research, issues, models, and strategies for implementation of action research.

589 Race, Identity and Representation in Education 3 Interdisciplinary research in race, identity and representations in education.

590 Internship V 2 (0-2) to 6 (0-18) May be repeated for credit; cumulative maximum 12 hours. By interview only. Opportunities in professional positions.

592 Social Theory in Education 3 Prereq doctoral student. Social theory and how it applies to intellectual work in education.

593 Pre-internship and Seminar 2 (1-3) Instructional practice in diverse classroom settings and reflection on that practice.

594 Integrating Fine Arts into K-8 Curriculum 2 Integrating Fine Arts (art, music, dance, drama) into K-8 curriculum; designed for pre-service MIT.

595 Internship and Seminar 10 (1-27) Instructional practice in classroom settings, reflection on practice; professional certification.

596 Topics in In-Service Education V 1-3 May be repeated for credit; cumulative maximum 12 hours. Prereq graduate standing or permission of instructor. Advanced study of research, practice, and contemporary issues in education.

597 Topics in In-Service Education V 1-3 May be repeated for credit; cumulative maximum 9 hours. New developments and applications on selected in-service and staff development topics.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Teaching and Learning - Elementary and Secondary

Degree offered: Doctor of Education

Faculty working with graduate students: 6

Deadline: Fall: January 10

Program Description

Our mission is to advance knowledge and ethical practice in the field of education. We do so through collaboration among universities, schools, families, and local, regional and global communities in a manner that reflects the ideals of democracy, social justice, and ecological sustainability.In brief, we offer teacher certification in elementary education (bachelor of arts in education, master in teaching) and secondary education (degree from major plus certification, master in teaching), and additional endorsements. We also offer professional certification, as well as a master of education (Ed.M.)and master of arts in education (M.A.) degrees. At the doctoral level, we offer two Pullman-based degrees. Those are the doctor of education(Ed.D.) in teacher leadership and the doctor of philosophy (Ph.D.) in education with specializations in cultural studies and social thought in education, language and literacy education, and special education.The research of our faculty contributes knowledge to our undergraduate and graduate programs and to the field of education in general.Our programs rely heavily on research-based, theoretical frameworks and the close connections we maintain with classroom teachers and other practitioners. We stress active engagement, critical problem-solving, and equity/fairness for all learners.

Degree Description

The four-campus Ed.D. with a specialization in Teacher Leadership is designed to prepare K-16 educators for intellectual and practical leadership within classrooms, schools, districts, and the larger educational policy arena. The program is built on an inquiry stance where students draw from theory, research, and practical experiences to investigate local and statewide teaching and learning programs and practices. Goals for Ed.D. students include generation of applicable knowledge as well as practical recommendations and solutions for complex educational problems, including those related to equity and diversity. Coursework will be centered around a series of both collaborative and individual projects that build from critical examination of participants' work and contexts. Program participants will broaden their capacity for instructional and programmatic leadership in both formal and informal roles within schools, districts, and educational communities. As part of a larger Ed.D. Program, the Teacher Leadership specialization will also provide students with opportunities to collaborate with educational professionals in educational administration and from community colleges.

Contact Information

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E-mail: gradstudies@wsu.edu

Faculty

Gisela Ernst-Slavit, Janet Frost, Eric Johnson, Tonda Liggett, Paula Price and Richard Sawyer.

EDRES

562 Epistemology, Inquiry, and Representation 3 Prereq doctoral standing; EdPsy 505 or c//. Epistemological assumptions and methodological strategies of research.

563 Principles of Research 3 Prereq CoPsy 501 or EdRes 562 . The centrality of literature review and the understanding of methods used in educational research; practice in designing research questions.

564 Qualitative Research 3 Prereq EdRes 563. Theoretical underpinnings of qualitative research; familiarity with published qualitative research in education; practical research skills.

565 Quantitative Research 3 Prereq EdPsy 508; EdRes/EdPsy 563. Statistical literacy in educational research; parametric and non-parametric methods.

566 Research Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Prereq doctoral student. Presentation and analysis of research; professional development in research presentation.

Teaching And Learning

T & L

411 Bilingual Methods and Materials Across Content Areas 3 Prereq either T & L 333, T & L 335, T & L 339, T & L 410, T & L 413, or graduate standing. Approaches, methods, and materials across content areas for the bilingual classroom.

501 Bilingual/ESL Education 3 May be repeated for credit; cumulative maximum 6 hours. Work with students from diverse linguistic and cultural backgrounds in educational settings.

502 Assessment for Teaching and Learning V 2-3 Instruction in sound assessment practices for preservice and inservice graduate students.

503 ESL Methods and Material for Secondary Content Teachers 2 Research-based ESL strategies and methods for pre-service and secondary content area teachers.

504 Advanced Study in Linguistics for Educators 3 Prereq admission to T & L graduate program. Use of linguistics to better understand second language learning and teaching and the physical aspects of acquiring a language.

505 ESL Methods for General Educators (K-8) 2 Research-based ESL strategies and methods for pre-service and experienced teachers.

506 Multicultural Classroom Instruction and Management 4 Instructional and management strategies for maximizing students' opportunities to learn in a multicultural setting.

507 Seminar in Literacy in Multicultural Settings I 3 Multicultural perspective to curriculum development and classroom literacy practices.

508 Seminar in Literacy in Multicultural Settings II 3 Prereq T & L 507. Multicultural perspective to curriculum development and classroom literacy practices.

509 Research in Curriculum and Assessment for Bilingual/ESL Education 3 Prereq T & L 510 or 549. Research in curriculum development for and assessment of language minority students.

510 Theoretical Foundations of Bilingual/ESL Education 3 Prereq either T & L 333, T & L 335, or T & L 413. Graduate-level counterpart of T & L 410; additional requirements. Credit not granted for both T & L 410 and 510.

512 Language and Cultural Factors in Mathematics 3 Prereq graduate standing. Research and instructional strategies related to linguistic and cultural influences on learning math.

513 Seminar in Middle School Education 3 For experienced teachers. Curriculum patterns and recent research regarding instruction and materials in the contemporary middle school.

514 Methods and Materials for Bilingual/ESL Education 3 Prereq T & L 510 or T & L 549. For pre-service and experienced teachers. Graduate-level counterpart of T & L 414; additional requirements. Credit not granted for both T & L 414 and 514.

515 The Education of Cultural and Linguistic Minority Students 3 Issues in the education of language minority students.

516 Advanced Study in Computer-Assisted Language Learning 3 Prereq T & L 510 or T & L 549. Research, theory, and practice in computer-assisted language learning.

517 Educational Technology in K-8 Schools 2 (1-2) Prereq admission to MIT program. Technology standards for teachers, technology use in schools, production techniques and instructional methods.

518 Integrating Technology into the Curriculum 3 Examination and articulation of the potential for new technologies to expand learning opportunities.

519 Instructional Media Production I 3 Instructional media development, emphasizing the theory and methods of instructional design, digital media production and evaluation.

520 Topics in Special Student Populations V 1-4 May be repeated for credit; cumulative maximum 6 hours. For K-12 teachers. Knowledge of special student populations and guidance in developing appropriate curricula.

521 Topics in Education V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and/or applications in selected areas of education.

522 Topics in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

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525 Classroom Management Seminar V 2-3 Contemporary issues in management of elementary, middle school, and secondary classrooms; issues of abuse.

526 Research in Multicultural Education 3 Prereq either T & L 515 or by permission. Research and instructional practices focusing on multicultural education.

527 Seminar in Teacher Education Instruction 1 May be repeated for credit; cumulative maximum 4 hours. Teacher preparation program components and rationale, university teaching strategies, and evaluation methods.

528 Literacy within the Disciplines 3 Explores literacy research and practices that enhance the learning of various disciplines taught in K-12 settings.

529 Place-Based Education 3 Theory and practice of place-based education with an emphasis on community-based action research and curriculum planning.

530 Innovations in Reading 2 or 3 Graduate-level counterpart of T & L 431; additional requirements. Credit not granted for both T & L 431 and 530.

532 Children's Literature in the Curriculum 2 Theory and classroom applications for selecting and using literature and storytelling in content areas; reading, writing, language development, the arts.

535 Gender, Power and Education 3 Interdisciplinary focus on the relationships among gender, power and education.

536 Cultural Studies in Education 3 Historical and conceptual background of the field of cultural studies.

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538 Writing Across the Curriculum 3 Writing for learning at grade levels K-12.

539 Innovations in Language Arts 3 The most recent developments in language arts instruction for pre-service and in-service teachers K-12.

540 Elementary School Social Studies 3 For candidates admitted to graduate teacher preparation and experienced teachers. Elementary structures of various social sciences; research findings related to instruction; classroom applications and materials.

541 Teacher Professional Certification: Pre-Assessment Seminar V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of ProCert application, Provisional Status/Employer Support verification (WAC 180-78A-505), and a copy of Residency Teaching Certificate. Candidates evaluate current teaching against standards to determine steps for professional growth plans which measure positive impact on student learning.

542 Teacher Professional Certification: Researching Exemplary Practices V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of T&L 541: Pre-Assessment Seminar. Teachers will apply exemplary practices, continue to assess their performance and college evidence of positive impact on student learning.

543 Teacher Professional Certification: Culminating Seminar V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of T & L 541(Pre-Assessment Seminar), Professional Growth Record initial activities approved, completed core credits, and Evidence/Artifacts gathered. Candidates will complete ProCert requirements to document positive impact on students' learning: set new goals; learn about National Board options.

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548 Teaching Adolescent Literature 3 Evaluating, selecting, and using literature for middle school and teenage students.

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550 Second Language Learning and Literacy 3 Prereq admission to doctoral program. Research on second language teaching and learning in literacy education with a focus on English language learners in US schools.

551 Psychology of Reading V 2-3 Psychological, perceptual, motivational, developmental and physiological aspects of reading.

552 Literacy Development I 3 For candidates admitted to graduate teacher preparation. Review of current research and approaches to instruction in the development of literacy in elementary and middle grades.

553 Assessment and Instruction for Reading: K-8 4 (3-3) Prereq T & L 307; T & L 321; T & L 322; T & L 551. Evaluation techniques and instructional practices for impacting the reading achievement of K-8 students.

554 Sociolinguistics 3 Prereq doctoral student. Interaction between language use and sociopolitical and cultural contexts; cultural and linguistic delivery and educational opportunity.

555 Seminar in Literacy Development 3 May be repeated for credit; cumulative maximum 6 hours. Current and historical research in reading/language arts, infancy through college and adult years; papers presented by faculty, invited speakers, and students.

556 Literacy Development II 3 Prereq for candidates admitted to graduate teacher preparation. Review of current research and approaches to instruction in the development of literacy in elementary and middle grades.

557 Research in Reading 3 Prereq EdPsy 505. Exploration of qualitative and quantitative reading research covering topics of current and historical importance.

558 Improving Comprehension through Literature 3 Key theoretical concepts and their implications for improved comprehension instruction, using children's literature.

559 Readings in Cultural Studies and Social Thought in Education 1 May be repeated for credit; cumulative maximum 3 hours. Current scholarship in the field of cultural studies in education and practices of schools.

560 Research in Teaching 3 May be repeated for credit; cumulative maximum 6 hours. Recent developments in research on teaching; both quantitative and qualitative research methodologies emphasized.

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564 Elementary School Mathematics Methods 3 For candidates admitted to graduate teacher preparation. Introduction to research, theory, and methods of teaching K-8 mathematics; emphasis on integrating theory and practice.

565 Introduction to Scholarly Inquiry 1 Prereq graduate standing. Introduction to the Ed.M program including the scholarship and research requirements and the role of students and action research.

566 Democratic Education 3 Prereq graduate standing. Rationale and skill to assist teachers in making classrooms more democratic.

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568 Psychological Foundations and Assessment of Literacy 3 Prereq admission to doctoral program. Historical look that blends the assessment of literacy and its psychological components.

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570 Theory and Research in Electronic Literacies 3 . Ideas of literacy and effects of technology on literacy and policy, particularly those issues addressing diverse learners.

571 Elementary School Science 3 Prereq for candidates admitted to graduate teacher preparation. Theories and research underlying science programs with classroom implications.

572 Elementary School Science Methods 3 For candidates admitted to graduate teacher preparation. Theoretical base to design and implement appropriate standards-based elementary science instruction.

574 Science for All: An Individual and Multicultural Perspective 3 Prereq for candidates admitted to graduate teacher preparation. Implications of cultural and individual diversity for understanding western scientific and mathematical thought; an activity-based, educational perspective.

575 Globalization and Identity in Education 3 Issues relating to the complexities of globalization and identity in education.

576 Youth Cultures in Education 3 Analysis of how youth cultures operate in society and how they are practiced in schools.

577 Curriculum Theory 3 Curriculum theory as the interdisciplinary study of educational experience.

580 Multicultural Education in a Global Society 3 Graduate-level counterpart of T & L 480; additional requirements. Credit not granted for both T & L 480 and 580.

583 Problem Solving in Elementary and Middle Level Education 3 For candidates admitted to graduate teacher preparation. Integration of knowledge and skills to address complex cases in teaching and learning.

587 Environment, Culture and Education 3 Prereq graduate standing. Role of education in the social, ecological, and political conflicts between culture and environment.

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589 Race, Identity and Representation in Education 3 Interdisciplinary research in race, identity and representations in education.

590 Internship V 2 (0-2) to 6 (0-18) May be repeated for credit; cumulative maximum 12 hours. By interview only. Opportunities in professional positions.

592 Social Theory in Education 3 Prereq doctoral student. Social theory and how it applies to intellectual work in education.

593 Pre-internship and Seminar 2 (1-3) Instructional practice in diverse classroom settings and reflection on that practice.

594 Integrating Fine Arts into K-8 Curriculum 2 Integrating Fine Arts (art, music, dance, drama) into K-8 curriculum; designed for pre-service MIT.

595 Internship and Seminar 10 (1-27) Instructional practice in classroom settings, reflection on practice; professional certification.

596 Topics in In-Service Education V 1-3 May be repeated for credit; cumulative maximum 12 hours. Prereq graduate standing or permission of instructor. Advanced study of research, practice, and contemporary issues in education.

597 Topics in In-Service Education V 1-3 May be repeated for credit; cumulative maximum 9 hours. New developments and applications on selected in-service and staff development topics.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Teaching and Learning - Elementary and Secondary

Degree offered: Master in Teaching

Program offered: Pullman, Spokane, Tri-Cities, Vancouver

Deadline: :
Fall: November 15

Program Description

Our mission is to advance knowledge and ethical practice in the field of education. We do so through collaboration among universities, schools, families, and local, regional and global communities in a manner that reflects the ideals of democracy, social justice, and ecological sustainability.In brief, we offer teacher certification in elementary education (bachelor of arts in education, master in teaching) and secondary education (degree from major plus certification, master in teaching), and additional endorsements. We also offer professional certification, as well as a master of education (Ed.M.)and master of arts in education (M.A.) degrees. At the doctoral level, we offer two Pullman-based degrees. Those are the doctor of education(Ed.D.) in teacher leadership and the doctor of philosophy (Ph.D.) in education with specializations in cultural studies and social thought in education, language and literacy education, and special education.The research of our faculty contributes knowledge to our undergraduate and graduate programs and to the field of education in general.Our programs rely heavily on research-based, theoretical frameworks and the close connections we maintain with classroom teachers and other practitioners. We stress active engagement, critical problem-solving, and equity/fairness for all learners.

Degree Description

The MIT is intended for those who possess a bachelor's degree in a field other than education and is designed to prepare students to become effective elementary or secondary education teachers. This program of study leads to a master's degree and a State of Washington elementary or secondary education teaching certificate. The MIT degree is available to students the Pullman, Spokane, and Vancouver campuses; however the programs differ slightly from campus to campus. The programs at the Vancouver campus consist of 15 months of intensive study and internships. The program on the Pullman/Spokane campuses consists of 13 months of intensive study and internships to complete teacher certification with additional time to complete the masters project. All of the MIT programs are cohort-based, forming a supportive network. The program consists of a wide range of pedagogy course work. Depending on the student's focus (elementary or secondary education), these courses may include literacy, social studies, science, math, reading, health, fitness, or fine arts methods. Students also study diversity in schools and society, educational technology, the social context of education, and research-based effective practices. When successfully completed, the MIT program results in a master's degree and teacher certification. Therefore all MIT students complete both certification and graduate research courses. All MIT students complete a research project and present the project results at the culmination of their program. The research projects are usually aimed at examining teaching and educational issues, with the focus on understanding the positive impact of education on student learning.

Contact Information

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E-mail: gradstudies@wsu.edu

ED AD

506 Social Context of Education 2 The interpretation of social context issues including historical, legal and cultural factors as these influence policies and practice in education.

EDPSY

503 Advanced Educational Psychology 2 Theories of learning and development as applied to education.

KIN

586 Methods of Health and Physical Education 2 Physical activity and health promotion for school programs, and educational/legal issues on physical and sexual abuse, K-8.

SP ED

520 Teaching in Inclusive Classrooms V 2-3 Graduate-level counterpart of Sp Ed 420; additional requirements. Credit not granted for both Sp Ed 420 and 520.

Teaching And Learning

T & L

502 Assessment for Teaching and Learning V 2-3 Instruction in sound assessment practices for preservice and inservice graduate students.

505 ESL Methods for General Educators (K-8) 2 Research-based ESL strategies and methods for pre-service and experienced teachers.

517 Educational Technology in K-8 Schools 2 (1-2) Prereq admission to MIT program. Technology standards for teachers, technology use in schools, production techniques and instructional methods.

525 Classroom Management Seminar V 2-3 Contemporary issues in management of elementary, middle school, and secondary classrooms; issues of abuse.

540 Elementary School Social Studies 3 For candidates admitted to graduate teacher preparation and experienced teachers. Elementary structures of various social sciences; research findings related to instruction; classroom applications and materials.

552 Literacy Development I 3 For candidates admitted to graduate teacher preparation. Review of current research and approaches to instruction in the development of literacy in elementary and middle grades.

556 Literacy Development II 3 Prereq for candidates admitted to graduate teacher preparation. Review of current research and approaches to instruction in the development of literacy in elementary and middle grades.

572 Elementary School Science Methods 3 For candidates admitted to graduate teacher preparation. Theoretical base to design and implement appropriate standards-based elementary science instruction.

588 Action Research: Teachers as Research 3 Theoretical concepts, research, issues, models, and strategies for implementation of action research.

593 Pre-internship and Seminar 2 (1-3) Instructional practice in diverse classroom settings and reflection on that practice.

594 Integrating Fine Arts into K-8 Curriculum 2 Integrating Fine Arts (art, music, dance, drama) into K-8 curriculum; designed for pre-service MIT.

595 Internship and Seminar 10 (1-27) Instructional practice in classroom settings, reflection on practice; professional certification.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Teaching and Learning - Elementary and Secondary

Degree offered: Master of Arts in Education

Faculty working with graduate students: 8

Program offered: Pullman, Tri-Cities

Deadline: Fall: January 10
Spring: September 1

Program Description

Our mission is to advance knowledge and ethical practice in the field of education. We do so through collaboration among universities, schools, families, and local, regional and global communities in a manner that reflects the ideals of democracy, social justice, and ecological sustainability.In brief, we offer teacher certification in elementary education (bachelor of arts in education, master in teaching) and secondary education (degree from major plus certification, master in teaching), and additional endorsements. We also offer professional certification, as well as a master of education (Ed.M.)and master of arts in education (M.A.) degrees. At the doctoral level, we offer two Pullman-based degrees. Those are the doctor of education(Ed.D.) in teacher leadership and the doctor of philosophy (Ph.D.) in education with specializations in cultural studies and social thought in education, language and literacy education, and special education.The research of our faculty contributes knowledge to our undergraduate and graduate programs and to the field of education in general.Our programs rely heavily on research-based, theoretical frameworks and the close connections we maintain with classroom teachers and other practitioners. We stress active engagement, critical problem-solving, and equity/fairness for all learners.

Degree Description

The Masters of Arts in Education offers graduate studies at the master's and doctoral degree levels. The specialization offers students rigorous and individually tailored programs of study. The Ed.D.* is designed to develop K-12 teachers, administrators, and researchers for intellectual leadership and practice in classrooms, schools, districts, agencies, and colleges/universities. Through research, students generate applicable knowledge as well as practical recommendations and solutions for complex educational challenges. The M.A. and Ed.M. degree programs are designed for students with bachelor degrees who have an interest in deepening their knowledge in a specific content area (in or outside the College of Education) as well as educational research. The master's degree programs also emphasize applying research, theory, and evidence-based practices to improve education. This specialization is designed especially for secondary teachers who wish to take courses in their teaching field as well as advanced coursework in teaching and learning.

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E-mail: gradstudies@wsu.edu

Faculty

Tariq Akmal, Pamela Bettis, Janet Frost, Leslie Hall, Jo Olson, Paula Price, Pauline Sameshima and Dawn Shinew.

ED AD

501 Philosophy of Education 3 Development of American educational philosophy.

507 Social Foundations of Education 3 Educational adaptations to the economic and social trends and forces.

510 Improvement of Instruction 3 Analysis and evaluation of instructional models with emphasis on information processing; implications for changing teaching style.

514 Basic Principles of Curriculum Design V 2-3 The application of theoretical concepts and approaches in the planning and design of curricula.

536 Introduction to Qualitative Research in Education 3 Prereq EdPsy 505. Introduction to the theory and methods of qualitative research; field relations, data collections, data analysis, hypothesis development, and theory generation.

580 School Organization and Administration 3 Readings and discussions on the theories and practices of school organization and administration.

582 Policy Formation and Analysis in Education 3 Political and organizational policy formation processes in educational organizations; policy analysis in education.

585 Financial Management in Education 3 Economics and financing of education; financial planning, budget development, investment analysis, bonding, cost effectiveness; current trends in educational finance.

EDPSY

502 Theoretical Foundations of Learning and Instruction 3 Historical and contemporary theories of learning and instruction: application of theory in counseling and teaching settings.

505 Research Methods I 3 Research methods; literature review; design, implementation, and interpretation of results.

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T & L

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507 Seminar in Literacy in Multicultural Settings I 3 Multicultural perspective to curriculum development and classroom literacy practices.

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509 Research in Curriculum and Assessment for Bilingual/ESL Education 3 Prereq T & L 510 or 549. Research in curriculum development for and assessment of language minority students.

510 Theoretical Foundations of Bilingual/ESL Education 3 Prereq either T & L 333, T & L 335, or T & L 413. Graduate-level counterpart of T & L 410; additional requirements. Credit not granted for both T & L 410 and 510.

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513 Seminar in Middle School Education 3 For experienced teachers. Curriculum patterns and recent research regarding instruction and materials in the contemporary middle school.

514 Methods and Materials for Bilingual/ESL Education 3 Prereq T & L 510 or T & L 549. For pre-service and experienced teachers. Graduate-level counterpart of T & L 414; additional requirements. Credit not granted for both T & L 414 and 514.

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589 **Race, Identity and Representation in Education** 3 Interdisciplinary research in race, identity and representations in education.

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596 **Topics in In-Service Education** V 1-3 May be repeated for credit; cumulative maximum 12 hours. Prereq graduate standing or permission of instructor. Advanced study of research, practice, and contemporary issues in education.

597 **Topics in In-Service Education** V 1-3 May be repeated for credit; cumulative maximum 9 hours. New developments and applications on selected in-service and staff development topics.

600 **Special Projects or Independent Study** V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 **Master's Research, Thesis, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

Teaching and Learning - Elementary and Secondary

Degree offered: Master of Arts in Education - Non Thesis

Faculty working with graduate students: 8

Program offered: Pullman, Tri-Cities

Deadline: Fall: January 10
Spring: September 1

Program Description

Our mission is to advance knowledge and ethical practice in the field of education. We do so through collaboration among universities, schools, families, and local, regional and global communities in a manner that reflects the ideals of democracy, social justice, and ecological sustainability.In brief, we offer teacher certification in elementary education (bachelor of arts in education, master in teaching) and secondary education (degree from major plus certification, master in teaching), and additional endorsements. We also offer professional certification, as well as a master of education (Ed.M.)and master of arts in education (M.A.) degrees. At the doctoral level, we offer two Pullman-based degrees. Those are the doctor of education(Ed.D.) in teacher leadership and the doctor of philosophy (Ph.D.) in education with specializations in cultural studies and social thought in education, language and literacy education, and special education.The research of our faculty contributes knowledge to our undergraduate and graduate programs and to the field of education in general.Our programs rely heavily on research-based, theoretical frameworks and the close connections we maintain with classroom teachers and other practitioners. We stress active engagement, critical problem-solving, and equity/fairness for all learners.

Degree Description

The Curriculum and Instruction specialization offers graduate studies at the master's and doctoral degree levels. The specialization offers students rigorous and individually tailored programs of study. The Ed.D.* is designed to develop K-12 teachers, administrators, and researchers for intellectual leadership and practice in classrooms, schools, districts, agencies, and colleges/universities. Through research, students in Curriculum and Instruction generate applicable knowledge as well as practical recommendations and solutions for complex educational challenges. The M.A. and Ed.M. degree programs are designed for students with bachelor degrees who have an interest in deepening their knowledge in a specific content area (in or outside the College of Education) as well as educational research in curriculum and instruction. The master's degree programs also emphasize applying research, theory, and evidence-based practices to improve education. This specialization is designed especially for secondary teachers who wish to take courses in their teaching field as well as advanced coursework in teaching and learning.

Contact Information

Graduate Coordinator
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Washington State University
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Pullman, WA 99164-2114
Telephone: 509-335-9195
Fax: 509-335-2097
E-mail: gradstudies@wsu.edu

Faculty

Tariq Akmal, Pamela Bettis, Janet Frost, Leslie Hall, Jo Olson, Paula Price, Pauline Sameshima and Dawn Shinew.

ED AD

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Teaching And Learning

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Teaching and Learning - Elementary and Secondary

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PO Box 642114
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Faculty

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Teaching And Learning

T & L

501 Bilingual/ESL Education 3 May be repeated for credit; cumulative maximum 6 hours. Work with students from diverse linguistic and cultural backgrounds in educational settings.

502 Assessment for Teaching and Learning V 2-3 Instruction in sound assessment practices for preservice and inservice graduate students.

503 ESL Methods and Material for Secondary Content Teachers 2 Research-based ESL strategies and methods for pre-service and secondary content area teachers.

504 Advanced Study in Linguistics for Educators 3 Prereq admission to T & L graduate program. Use of linguistics to better understand second language learning and teaching and the physical aspects of acquiring a language.

505 ESL Methods for General Educators (K-8) 2 Research-based ESL strategies and methods for pre-service and experienced teachers.

506 Multicultural Classroom Instruction and Management 4 Instructional and management strategies for maximizing students' opportunities to learn in a multicultural setting.

507 Seminar in Literacy in Multicultural Settings I 3 Multicultural perspective to curriculum development and classroom literacy practices.

508 Seminar in Literacy in Multicultural Settings II 3 Prereq T & L 507. Multicultural perspective to curriculum development and classroom literacy practices.

509 Research in Curriculum and Assessment for Bilingual/ESL Education 3 Prereq T & L 510 or 549. Research in curriculum development for and assessment of language minority students.

510 Theoretical Foundations of Bilingual/ESL Education 3 Prereq either T & L 333, T & L 335, or T & L 413. Graduate-level counterpart of T & L 410; additional requirements. Credit not granted for both T & L 410 and 510.

512 Language and Cultural Factors in Mathematics 3 Prereq graduate standing. Research and instructional strategies related to linguistic and cultural influences on learning math.

513 Seminar in Middle School Education 3 For experienced teachers. Curriculum patterns and recent research regarding instruction and materials in the contemporary middle school.

514 Methods and Materials for Bilingual/ESL Education 3 Prereq T & L 510 or T & L 549. For pre-service and experienced teachers. Graduate-level counterpart of T & L 414; additional requirements. Credit not granted for both T & L 414 and 514.

515 The Education of Cultural and Linguistic Minority Students 3 Issues in the education of language minority students.

516 Advanced Study in Computer-Assisted Language Learning 3 Prereq T & L 510 or T & L 549. Research, theory, and practice in computer-assisted language learning.

517 Educational Technology in K-8 Schools 2 (1-2) Prereq admission to MIT program. Technology standards for teachers, technology use in schools, production techniques and instructional methods.

518 Integrating Technology into the Curriculum 3 Examination and articulation of the potential for new technologies to expand learning opportunities.

519 Instructional Media Production I 3 Instructional media development, emphasizing the theory and methods of instructional design, digital media production and evaluation.

520 Topics in Special Student Populations V 1-4 May be repeated for credit; cumulative maximum 6 hours. For K-12 teachers. Knowledge of special student populations and guidance in developing appropriate curricula.

521 Topics in Education V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and/or applications in selected areas of education.

522 Topics in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

523 Topics in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

524 Topics in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

525 Classroom Management Seminar V 2-3 Contemporary issues in management of elementary, middle school, and secondary classrooms; issues of abuse.

526 Research in Multicultural Education 3 Prereq either T & L 515 or by permission. Research and instructional practices focusing on multicultural education.

527 Seminar in Teacher Education Instruction 1 May be repeated for credit; cumulative maximum 4 hours. Teacher preparation program components and rationale, university teaching strategies, and evaluation methods.

528 Literacy within the Disciplines 3 Explores literacy research and practices that enhance the learning of various disciplines taught in K-12 settings.

529 Place-Based Education 3 Theory and practice of place-based education with an emphasis on community-based action research and curriculum planning.

530 Innovations in Reading 2 or 3 Graduate-level counterpart of T & L 431; additional requirements. Credit not granted for both T & L 431 and 530.

532 Children's Literature in the Curriculum 2 Theory and classroom applications for selecting and using literature and storytelling in content areas; reading, writing, language development, the arts.

535 Gender, Power and Education 3 Interdisciplinary focus on the relationships among gender, power and education.

536 Cultural Studies in Education 3 Historical and conceptual background of the field of cultural studies.

537 Seminar in Language, Literacy, and Culture 3 Interrelationships between schools, literacy, and student cultural background.

538 Writing Across the Curriculum 3 Writing for learning at grade levels K-12.

539 Innovations in Language Arts 3 The most recent developments in language arts instruction for pre-service and in-service teachers K-12.

540 Elementary School Social Studies 3 For candidates admitted to graduate teacher preparation and experienced teachers. Elementary structures of various social sciences; research findings related to instruction; classroom applications and materials.

541 Teacher Professional Certification: Pre-Assessment Seminar V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of ProCert application, Provisional Status/Employer Support verification (WAC 180-78A-505), and a copy of Residency Teaching Certificate. Candidates evaluate current teaching against standards to determine steps for professional growth plans which measure positive impact on student learning.

542 Teacher Professional Certification: Researching Exemplary Practices V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of T&L 541: Pre-Assessment Seminar. Teachers will apply exemplary practices, continue to assess their performance and college evidence of positive impact on student learning.

543 Teacher Professional Certification: Culminating Seminar V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of T & L 541(Pre-Assessment Seminar), Professional Growth Record initial activities approved, completed core credits, and Evidence/Artifacts gathered. Candidates will complete ProCert requirements to document positive impact on students' learning: set new goals; learn about National Board options.

544 Advanced Children's Literature 3 Trends, issues, and research in children's literature.

546 Teaching Writing in the Elementary School 3 Theory and research relevant to instructional approaches and practices for teaching writing in elementary schools.

547 Teaching Folk Literature to Children and Adolescents 3 Folk literature as a genre in child and adolescent literature; curriculum applications; reading, language development, social studies, creative expression.

548 Teaching Adolescent Literature 3 Evaluating, selecting, and using literature for middle school and teenage students.

549 Communicating in a Multilingual Society 3 Prereq T & L 333, T & L 335, T & L 413 or graduate standing. Study of language in social and educational context and its relation to cultural and linguistic diversity.

550 Second Language Learning and Literacy 3 Prereq admission to doctoral program. Research on second language teaching and learning in literacy education with a focus on English language learners in US schools.

551 Psychology of Reading V 2-3 Psychological, perceptual, motivational, developmental and physiological aspects of reading.

552 Literacy Development I 3 For candidates admitted to graduate teacher preparation. Review of current research and approaches to instruction in the development of literacy in elementary and middle grades.

553 Assessment and Instruction for Reading: K-8 4 (3-3) Prereq T & L 307; T & L 321; T & L 322; T & L 551. Evaluation techniques and instructional practices for impacting the reading achievement of K-8 students.

554 **Sociolinguistics** 3 Prereq doctoral student. Interaction between language use and sociopolitical and cultural contexts; cultural and linguistic delivery and educational opportunity.

555 **Seminar in Literacy Development** 3 May be repeated for credit; cumulative maximum 6 hours. Current and historical research in reading/language arts, infancy through college and adult years; papers presented by faculty, invited speakers, and students.

556 **Literacy Development II** 3 Prereq for candidates admitted to graduate teacher preparation. Review of current research and approaches to instruction in the development of literacy in elementary and middle grades.

557 **Research in Reading** 3 Prereq EdPsy 505. Exploration of qualitative and quantitative reading research covering topics of current and historical importance.

558 **Improving Comprehension through Literature** 3 Key theoretical concepts and their implications for improved comprehension instruction, using children's literature.

559 **Readings in Cultural Studies and Social Thought in Education** 1 May be repeated for credit; cumulative maximum 3 hours. Current scholarship in the field of cultural studies in education and practices of schools.

560 **Research in Teaching** 3 May be repeated for credit; cumulative maximum 6 hours. Recent developments in research on teaching; both quantitative and qualitative research methodologies emphasized.

561 **Elementary School Mathematics** 3 Research on curriculum and instruction issues in elementary school mathematics.

564 **Elementary School Mathematics Methods** 3 For candidates admitted to graduate teacher preparation. Introduction to research, theory, and methods of teaching K-8 mathematics; emphasis on integrating theory and practice.

565 **Introduction to Scholarly Inquiry** 1 Prereq graduate standing. Introduction to the Ed.M program including the scholarship and research requirements and the role of students and action research.

566 **Democratic Education** 3 Prereq graduate standing. Rationale and skill to assist teachers in making classrooms more democratic.

567 **Social Foundations of Literacy** 3 Prereq admission to doctoral program. Social, cultural and political factors which influence the acquisition and use of literacy.

568 **Psychological Foundations and Assessment of Literacy** 3 Prereq admission to doctoral program. Historical look that blends the assessment of literacy and its psychological components.

569 **Critical Analysis of Children's and Young Adult Literature** 3 Prereq doctoral student. Multicultural analysis of children's and adolescent literature and its pedagogical and sociopolitical implications and possibilities.

570 **Theory and Research in Electronic Literacies** 3 . Ideas of literacy and effects of technology on literacy and policy, particularly those issues addressing diverse learners.

571 **Elementary School Science** 3 Prereq for candidates admitted to graduate teacher preparation. Theories and research underlying science programs with classroom implications.

572 **Elementary School Science Methods** 3 For candidates admitted to graduate teacher preparation. Theoretical base to design and implement appropriate standards-based elementary science instruction.

574 **Science for All: An Individual and Multicultural Perspective** 3 Prereq for candidates admitted to graduate teacher preparation. Implications of cultural and individual diversity for understanding western scientific and mathematical thought; an activity-based, educational perspective.

575 **Globalization and Identity in Education** 3 Issues relating to the complexities of globalization and identity in education.

576 **Youth Cultures in Education** 3 Analysis of how youth cultures operate in society and how they are practiced in schools.

577 **Curriculum Theory** 3 Curriculum theory as the interdisciplinary study of educational experience.

580 **Multicultural Education in a Global Society** 3 Graduate-level counterpart of T & L 480; additional requirements. Credit not granted for both T & L 480 and 580.

583 **Problem Solving in Elementary and Middle Level Education** 3 For candidates admitted to graduate teacher preparation. Integration of knowledge and skills to address complex cases in teaching and learning.

587 **Environment, Culture and Education** 3 Prereq graduate standing. Role of education in the social, ecological, and political conflicts between culture and environment.

588 **Action Research: Teachers as Research** 3 Theoretical concepts, research, issues, models, and strategies for implementation of action research.

589 **Race, Identity and Representation in Education** 3 Interdisciplinary research in race, identity and representations in education.

590 **Internship** V 2 (0-2) to 6 (0-18) May be repeated for credit; cumulative maximum 12 hours. By interview only. Opportunities in professional positions.

592 **Social Theory in Education** 3 Prereq doctoral student. Social theory and how it applies to intellectual work in education.

593 **Pre-internship and Seminar** 2 (1-3) Instructional practice in diverse classroom settings and reflection on that practice.

594 **Integrating Fine Arts into K-8 Curriculum** 2 Integrating Fine Arts (art, music, dance, drama) into K-8 curriculum; designed for pre-service MIT.

595 **Internship and Seminar** 10 (1-27) Instructional practice in classroom settings, reflection on practice; professional certification.

596 **Topics in In-Service Education** V 1-3 May be repeated for credit; cumulative maximum 12 hours. Prereq graduate standing or permission of instructor. Advanced study of research, practice, and contemporary issues in education.

597 **Topics in In-Service Education** V 1-3 May be repeated for credit; cumulative maximum 9 hours. New developments and applications on selected in-service and staff development topics.

600 **Special Projects or Independent Study** V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 **Master's Special Problems, Directed Study, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

Teaching and Learning - English as a Second Language

Degree offered: Master of Arts in Education - Non Thesis

Faculty working with graduate students: 7

Program offered: Pullman, Tri-Cities, Vancouver

Deadline: Fall: January 10
Spring: September 1

Program Description

Our mission is to advance knowledge and ethical practice in the field of education. We do so through collaboration among universities, schools, families, and local, regional and global communities in a manner that reflects the ideals of democracy, social justice, and ecological sustainability.In brief, we offer teacher certification in elementary education (bachelor of arts in education, master in teaching) and secondary education (degree from major plus certification, master in teaching), and additional endorsements. We also offer professional certification, as well as a master of education (Ed.M.)and master of arts in education (M.A.) degrees. At the doctoral level, we offer two Pullman-based degrees. Those are the doctor of education(Ed.D.) in teacher leadership and the doctor of philosophy (Ph.D.) in education with specializations in cultural studies and social thought in education, language and literacy education, and special education.The research of our faculty contributes knowledge to our undergraduate and graduate programs and to the field of education in general.Our programs rely heavily on research-based, theoretical frameworks and the close connections we maintain with classroom teachers and other practitioners. We stress active engagement, critical problem-solving, and equity/fairness for all learners.

Degree Description

Faculty in the area of Language and Literacy Education offer specializations in three degrees. The two master's degrees (Ed.M., M.A.) focus on literacy or English as a Second Language (ESL). The Ed.M. requires a culminating project. The M.A., a research-focused degree, requires a thesis. Teaching endorsements are available in reading and in ESL and may be a part of the master's degree coursework.

Contact Information

Graduate Coordinator
Office of Graduate Studies
Washington State University
Cleveland Hall 252
PO Box 642114
Pullman, WA 99164-2114
Telephone: 509-335-9195
Fax: 509-335-2097
E-mail: gradstudies@wsu.edu

Faculty

Joy Egbert, Gisela Ernst-Slavit, Leslie Huff, David Johnson, Eric Johnson, Tonda Liggett and Thomas Salsbury.

EDPSY

505 Research Methods I 3 Research methods; literature review; design, implementation, and interpretation of results.

508 Educational Statistics 3 Prereq EdPsy 505. Introductory course for graduate students in applied statistics for the behavioral sciences.

Teaching And Learning

T & L

501 Bilingual/ESL Education 3 May be repeated for credit; cumulative maximum 6 hours. Work with students from diverse linguistic and cultural backgrounds in educational settings.

504 Advanced Study in Linguistics for Educators 3 Prereq admission to T & L graduate program. Use of linguistics to better understand second language learning and teaching and the physical aspects of acquiring a language.

509 Research in Curriculum and Assessment for Bilingual/ESL Education 3 Prereq T & L 510 or 549. Research in curriculum development for and assessment of language minority students.

510 Theoretical Foundations of Bilingual/ESL Education 3 Prereq either T & L 333, T & L 335, or T & L 413. Graduate-level counterpart of T & L 410; additional requirements. Credit not granted for both T & L 410 and 510.

514 Methods and Materials for Bilingual/ESL Education 3 Prereq T & L 510 or T & L 549. For pre-service and experienced teachers. Graduate-level counterpart of T & L 414; additional requirements. Credit not granted for both T & L 414 and 514.

516 Advanced Study in Computer-Assisted Language Learning 3 Prereq T & L 510 or T & L 549. Research, theory, and practice in computer-assisted language learning.

518 Integrating Technology into the Curriculum 3 Examination and articulation of the potential for new technologies to expand learning opportunities.

519 Instructional Media Production I 3 Instructional media development, emphasizing the theory and methods of instructional design, digital media production and evaluation.

522 Topics in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

537 Seminar in Language, Literacy, and Culture 3 Interrelationships between schools, literacy, and student cultural background.

544 Advanced Children's Literature 3 Trends, issues, and research in children's literature.

549 Communicating in a Multilingual Society 3 Prereq T & L 333, T & L 335, T & L 413 or graduate standing. Study of language in social and educational context and its relation to cultural and linguistic diversity.

555 Seminar in Literacy Development 3 May be repeated for credit; cumulative maximum 6 hours. Current and historical research in reading/language arts, infancy through college and adult years; papers presented by faculty, invited speakers, and students.

588 Action Research: Teachers as Research 3 Theoretical concepts, research, issues, models, and strategies for implementation of action research.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Teaching and Learning - English Language Learners

Degree offered: Master of Arts in Education

Faculty working with graduate students: 7

Graduate students: 5

Program offered: Pullman, Tri-Cities, Vancouver

Deadline: Fall: January 10
Spring: July 1

Program Description

Our mission is to advance knowledge and ethical practice in the field of education. We do so through collaboration among universities, schools, families, and local, regional and global communities in a manner that reflects the ideals of democracy, social justice, and ecological sustainability.In brief, we offer teacher certification in elementary education (bachelor of arts in education, master in teaching) and secondary education (degree from major plus certification, master in teaching), and additional endorsements. We also offer professional certification, as well as a master of education (Ed.M.)and master of arts in education (M.A.) degrees. At the doctoral level, we offer two Pullman-based degrees. Those are the doctor of education(Ed.D.) in teacher leadership and the doctor of philosophy (Ph.D.) in education with specializations in cultural studies and social thought in education, language and literacy education, and special education.The research of our faculty contributes knowledge to our undergraduate and graduate programs and to the field of edu-

cation in general.Our programs rely heavily on research-based, theoretical frameworks and the close connections we maintain with classroom teachers and other practitioners. We stress active engagement, critical problem-solving, and equity/fairness for all learners.

Degree Description

English language learners (ELLs) comprise 23 percent of all K-12 learners in Washington State schools and represent 96 language groups. The number and diversity of ELLs continue to grow; however, the number of mainstream teachers prepared to deal with the needs of non-native English speakers has not kept pace with this increasing ELL population.

Contact Information

Graduate Coordinator
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PO Box 642114
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Telephone: 509-335-9195
Fax: 509-335-2097
E-mail: gradstudies@wsu.edu

Faculty

Joy Egbert, Gisela Ernst-Slavit, Leslie Huff, David Johnson, Eric Johnson, Tonda Liggett and Thomas Salsbury.

ED AD

501 Philosophy of Education 3 Development of American educational philosophy.

507 Social Foundations of Education 3 Educational adaptations to the economic and social trends and forces.

EDPSY

502 Theoretical Foundations of Learning and Instruction 3 Historical and contemporary theories of learning and instruction: application of theory in counseling and teaching settings.

505 Research Methods I 3 Research methods; literature review; design, implementation, and interpretation of results.

EDRES

562 Epistemology, Inquiry, and Representation 3 Prereq doctoral standing; EdPsy 505 or c//. Epistemological assumptions and methodological strategies of research.

563 Principles of Research 3 Prereq CoPsy 501 or EdRes 562 . The centrality of literature review and the understanding of methods used in educational research; practice in designing research questions.

564 Qualitative Research 3 Prereq EdRes 563. Theoretical underpinnings of qualitative research; familiarity with published qualitative research in education; practical research skills.

565 Quantitative Research 3 Prereq EdPsy 508; EdRes/EdPsy 563. Statistical literacy in educational research; parametric and non-parametric methods.

566 Research Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Prereq doctoral student. Presentation and analysis of research; professional development in research presentation.

Teaching And Learning

T & L

501 Bilingual/ESL Education 3 May be repeated for credit; cumulative maximum 6 hours. Work with students from diverse linguistic and cultural backgrounds in educational settings.

502 Assessment for Teaching and Learning V 2-3 Instruction in sound assessment practices for preservice and inservice graduate students.

503 ESL Methods and Material for Secondary Content Teachers 2 Research-based ESL strategies and methods for pre-service and secondary content area teachers.

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506 Multicultural Classroom Instruction and Management 4 Instructional and management strategies for maximizing students' opportunities to learn in a multicultural setting.

507 Seminar in Literacy in Multicultural Settings I 3 Multicultural perspective to curriculum development and classroom literacy practices.

508 Seminar in Literacy in Multicultural Settings II 3 Prereq T & L 507. Multicultural perspective to curriculum development and classroom literacy practices.

509 Research in Curriculum and Assessment for Bilingual/ESL Education 3 Prereq T & L 510 or 549. Research in curriculum development for and assessment of language minority students.

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512 Language and Cultural Factors in Mathematics 3 Prereq graduate standing. Research and instructional strategies related to linguistic and cultural influences on learning math.

513 Seminar in Middle School Education 3 For experienced teachers. Curriculum patterns and recent research regarding instruction and materials in the contemporary middle school.

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515 The Education of Cultural and Linguistic Minority Students 3 Issues in the education of language minority students.

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522 **Topics in Education** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

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525 **Classroom Management Seminar** V 2-3 Contemporary issues in management of elementary, middle school, and secondary classrooms; issues of abuse.

526 **Research in Multicultural Education** 3 Prereq either T & L 515 or by permission. Research and instructional practices focusing on multicultural education.

527 **Seminar in Teacher Education Instruction** 1 May be repeated for credit; cumulative maximum 4 hours. Teacher preparation program components and rationale, university teaching strategies, and evaluation methods.

528 **Literacy within the Disciplines** 3 Explores literacy research and practices that enhance the learning of various disciplines taught in K-12 settings.

529 **Place-Based Education** 3 Theory and practice of place-based education with an emphasis on community-based action research and curriculum planning.

530 **Innovations in Reading** 2 or 3 Graduate-level counterpart of T & L 431; additional requirements. Credit not granted for both T & L 431 and 530.

532 **Children's Literature in the Curriculum** 2 Theory and classroom applications for selecting and using literature and storytelling in content areas; reading, writing, language development, the arts.

533 **Middle Level Mathematics Pedagogy and Philosophy** 3 Middle-school philosophy; understanding of effective standards and research-based instructional methods.

535 **Gender, Power and Education** 3 Interdisciplinary focus on the relationships among gender, power and education.

536 **Cultural Studies in Education** 3 Historical and conceptual background of the field of cultural studies.

537 **Seminar in Language, Literacy, and Culture** 3 Interrelationships between schools, literacy, and student cultural background.

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556 **Literacy Development II** 3 Prereq for candidates admitted to graduate teacher preparation. Review of current research and approaches to instruction in the development of literacy in elementary and middle grades.

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561 Elementary School Mathematics 3 Research on curriculum and instruction issues in elementary school mathematics.

564 Elementary School Mathematics Methods 3 For candidates admitted to graduate teacher preparation. Introduction to research, theory, and methods of teaching K-8 mathematics; emphasis on integrating theory and practice.

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597 Topics in In-Service Education V 1-3 May be repeated for credit; cumulative maximum 9 hours. New developments and applications on selected in-service and staff development topics.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Teaching and Learning - English Language Learners

Degree offered: Master of Education

Faculty working with graduate students: 7

Graduate students: 23

Program offered: Pullman, Tri-Cities, Vancouver

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Spring: July 1

Program Description

Our mission is to advance knowledge and ethical practice in the field of education. We do so through collaboration among universities, schools, families, and local, regional and global communities in a manner that reflects the ideals of democracy, social justice, and ecological sustainability.In brief, we offer teacher certification in elementary education (bachelor of arts in education, master in teaching) and secondary education (degree from major plus certification, master in teaching), and

additional endorsements. We also offer professional certification, as well as a master of education (Ed.M.)and master of arts in education (M.A.) degrees. At the doctoral level, we offer two Pullman-based degrees. Those are the doctor of education(Ed.D.) in teacher leadership and the doctor of philosophy (Ph.D.) in education with specializations in cultural studies and social thought in education, language and literacy education, and special education.The research of our faculty contributes knowledge to our undergraduate and graduate programs and to the field of education in general.Our programs rely heavily on research-based, theoretical frameworks and the close connections we maintain with classroom teachers and other practitioners. We stress active engagement, critical problem-solving, and equity/fairness for all learners.

Degree Description

English language learners (ELLs) comprise 23 percent of all K-12 learners in Washington State schools and represent 96 language groups. The number and diversity of ELLs continue to grow; however, the number of mainstream teachers prepared to deal with the needs of non-native English speakers has not kept pace with this increasing ELL population. 4000 Character Limit.

Contact Information

Graduate Coordinator
Office of Graduate Studies
Washington State University
Cleveland Hall 252
PO Box 642114
Pullman, WA 99164-2114
Telephone: 509-335-9195
Fax: 509-335-2097
E-mail: gradstudies@wsu.edu

Faculty

Joy Egbert, Gisela Ernst-Slavit, Leslie Huff, David Johnson, Eric Johnson, Tonda Liggett and Thomas Salsbury.

ED AD

501 Philosophy of Education 3 Development of American educational philosophy.

536 Introduction to Qualitative Research in Education 3 Prereq EdPsy 505. Introduction to the theory and methods of qualitative research; field relations, data collections, data analysis, hypothesis development, and theory generation.

EDPSY

505 Research Methods I 3 Research methods; literature review; design, implementation, and interpretation of results.

508 Educational Statistics 3 Prereq EdPsy 505. Introductory course for graduate students in applied statistics for the behavioral sciences.

EDRES

562 Epistemology, Inquiry, and Representation 3 Prereq doctoral standing; EdPsy 505 or c//. Epistemological assumptions and methodological strategies of research.

563 Principles of Research 3 Prereq CoPsy 501 or EdRes 562 . The centrality of literature review and the understanding of methods used in educational research; practice in designing research questions.

564 Qualitative Research 3 Prereq EdRes 563. Theoretical underpinnings of qualitative research; familiarity with published qualitative research in education; practical research skills.

565 Quantitative Research 3 Prereq EdPsy 508; EdRes/EdPsy 563. Statistical literacy in educational research; parametric and non-parametric methods.

566 Research Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Prereq doctoral student. Presentation and analysis of research; professional development in research presentation.

Teaching And Learning

T & L

501 Bilingual/ESL Education 3 May be repeated for credit; cumulative maximum 6 hours. Work with students from diverse linguistic and cultural backgrounds in educational settings.

502 Assessment for Teaching and Learning V 2-3 Instruction in sound assessment practices for preservice and inservice graduate students.

503 ESL Methods and Material for Secondary Content Teachers 2 Research-based ESL strategies and methods for pre-service and secondary content area teachers.

504 Advanced Study in Linguistics for Educators 3 Prereq admission to T & L graduate program. Use of linguistics to better understand second language learning and teaching and the physical aspects of acquiring a language.

505 ESL Methods for General Educators (K-8) 2 Research-based ESL strategies and methods for pre-service and experienced teachers.

506 Multicultural Classroom Instruction and Management 4 Instructional and management strategies for maximizing students' opportunities to learn in a multicultural setting.

507 Seminar in Literacy in Multicultural Settings I 3 Multicultural perspective to curriculum development and classroom literacy practices.

508 Seminar in Literacy in Multicultural Settings II 3 Prereq T & L 507. Multicultural perspective to curriculum development and classroom literacy practices.

509 Research in Curriculum and Assessment for Bilingual/ESL Education 3 Prereq T & L 510 or 549. Research in curriculum development for and assessment of language minority students.

510 Theoretical Foundations of Bilingual/ESL Education 3 Prereq either T & L 333, T & L 335, or T & L 413. Graduate-level counterpart of T & L 410; additional requirements. Credit not granted for both T & L 410 and 510.

512 Language and Cultural Factors in Mathematics 3 Prereq graduate standing. Research and instructional strategies related to linguistic and cultural influences on learning math.

513 Seminar in Middle School Education 3 For experienced teachers. Curriculum patterns and recent research regarding instruction and materials in the contemporary middle school.

514 Methods and Materials for Bilingual/ESL Education 3 Prereq T & L 510 or T & L 549. For pre-service and experienced teachers. Graduate-level counterpart of T & L 414; additional requirements. Credit not granted for both T & L 414 and 514.

515 The Education of Cultural and Linguistic Minority Students 3 Issues in the education of language minority students.

516 Advanced Study in Computer-Assisted Language Learning 3 Prereq T & L 510 or T & L 549. Research, theory, and practice in computer-assisted language learning.

517 Educational Technology in K-8 Schools 2 (1-2) Prereq admission to MIT program. Technology standards for teachers, technology use in schools, production techniques and instructional methods.

518 Integrating Technology into the Curriculum 3 Examination and articulation of the potential for new technologies to expand learning opportunities.

519 Instructional Media Production I 3 Instructional media development, emphasizing the theory and methods of instructional design, digital media production and evaluation.

520 Topics in Special Student Populations V 1-4 May be repeated for credit; cumulative maximum 6 hours. For K-12 teachers. Knowledge of special student populations and guidance in developing appropriate curricula.

521 Topics in Education V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and/or applications in selected areas of education.

522 Topics in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

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524 Topics in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

525 Classroom Management Seminar V 2-3 Contemporary issues in management of elementary, middle school, and secondary classrooms; issues of abuse.

526 Research in Multicultural Education 3 Prereq either T & L 515 or by permission. Research and instructional practices focusing on multicultural education.

527 Seminar in Teacher Education Instruction 1 May be repeated for credit; cumulative maximum 4 hours. Teacher preparation program components and rationale, university teaching strategies, and evaluation methods.

528 Literacy within the Disciplines 3 Explores literacy research and practices that enhance the learning of various disciplines taught in K-12 settings.

529 Place-Based Education 3 Theory and practice of place-based education with an emphasis on community-based action research and curriculum planning.

530 Innovations in Reading 2 or 3 Graduate-level counterpart of T & L 431; additional requirements. Credit not granted for both T & L 431 and 530.

532 Children's Literature in the Curriculum 2 Theory and classroom applications for selecting and using literature and storytelling in content areas; reading, writing, language development, the arts.

533 Middle Level Mathematics Pedagogy and Philosophy 3 Middle-school philosophy; understanding of effective standards and research-based instructional methods.

535 Gender, Power and Education 3 Interdisciplinary focus on the relationships among gender, power and education.

536 Cultural Studies in Education 3 Historical and conceptual background of the field of cultural studies.

537 Seminar in Language, Literacy, and Culture 3 Interrelationships between schools, literacy, and student cultural background.

538 Writing Across the Curriculum 3 Writing for learning at grade levels K-12.

539 Innovations in Language Arts 3 The most recent developments in language arts instruction for pre-service and in-service teachers K-12.

540 Elementary School Social Studies 3 For candidates admitted to graduate teacher preparation and experienced teachers. Elementary structures of various social sciences; research findings related to instruction; classroom applications and materials.

541 Teacher Professional Certification: Pre-Assessment Seminar V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of ProCert application, Provisional Status/Employer Support verification (WAC 180-78A-505), and a copy of Residency Teaching Certificate. Candidates evaluate current teaching against standards to determine steps for professional growth plans which measure positive impact on student learning.

542 Teacher Professional Certification: Researching Exemplary Practices V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of T&L 541: Pre-Assessment Seminar. Teachers will apply exemplary practices, continue to assess their performance and college evidence of positive impact on student learning.

543 Teacher Professional Certification: Culminating Seminar V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of T & L 541(Pre-Assessment Seminar), Professional Growth Record initial activities approved, completed core credits, and Evidence/Artifacts gathered. Candidates will complete ProCert requirements to document positive impact on students' learning: set new goals; learn about National Board options.

544 Advanced Children's Literature 3 Trends, issues, and research in children's literature.

546 Teaching Writing in the Elementary School 3 Theory and research relevant to instructional approaches and practices for teaching writing in elementary schools.

547 Teaching Folk Literature to Children and Adolescents 3 Folk literature as a genre in child and adolescent literature; curriculum applications; reading, language development, social studies, creative expression.

548 Teaching Adolescent Literature 3 Evaluating, selecting, and using literature for middle school and teenage students.

549 Communicating in a Multilingual Society 3 Prereq T & L 333, T & L 335, T & L 413 or graduate standing. Study of language in social and educational context and its relation to cultural and linguistic diversity.

550 Second Language Learning and Literacy 3 Prereq admission to doctoral program. Research on second language teaching and learning in literacy education with a focus on English language learners in US schools.

551 Psychology of Reading V 2-3 Psychological, perceptual, motivational, developmental and physiological aspects of reading.

552 Literacy Development I 3 For candidates admitted to graduate teacher preparation. Review of current research and approaches to instruction in the development of literacy in elementary and middle grades.

553 Assessment and Instruction for Reading: K-8 4 (3-3) Prereq T & L 307; T & L 321; T & L 322; T & L 551. Evaluation techniques and instructional practices for impacting the reading achievement of K-8 students.

554 Sociolinguistics 3 Prereq doctoral student. Interaction between language use and sociopolitical and cultural contexts; cultural and linguistic delivery and educational opportunity.

555 Seminar in Literacy Development 3 May be repeated for credit; cumulative maximum 6 hours. Current and historical research in reading/language arts, infancy through college and adult years; papers presented by faculty, invited speakers, and students.

556 Literacy Development II 3 Prereq for candidates admitted to graduate teacher preparation. Review of current research and approaches to instruction in the development of literacy in elementary and middle grades.

557 Research in Reading 3 Prereq EdPsy 505. Exploration of qualitative and quantitative reading research covering topics of current and historical importance.

558 Improving Comprehension through Literature 3 Key theoretical concepts and their implications for improved comprehension instruction, using children's literature.

559 Readings in Cultural Studies and Social Thought in Education 1 May be repeated for credit; cumulative maximum 3 hours. Current scholarship in the field of cultural studies in education and practices of schools.

560 Research in Teaching 3 May be repeated for credit; cumulative maximum 6 hours. Recent developments in research on teaching; both quantitative and qualitative research methodologies emphasized.

561 Elementary School Mathematics 3 Research on curriculum and instruction issues in elementary school mathematics.

564 Elementary School Mathematics Methods 3 For candidates admitted to graduate teacher preparation. Introduction to research, theory, and methods of teaching K-8 mathematics; emphasis on integrating theory and practice.

565 Introduction to Scholarly Inquiry 1 Prereq graduate standing. Introduction to the Ed.M program including the scholarship and research requirements and the role of students and action research.

566 Democratic Education 3 Prereq graduate standing. Rationale and skill to assist teachers in making classrooms more democratic.

567 Social Foundations of Literacy 3 Prereq admission to doctoral program. Social, cultural and political factors which influence the acquisition and use of literacy.

568 Psychological Foundations and Assessment of Literacy 3 Prereq admission to doctoral program. Historical look that blends the assessment of literacy and its psychological components.

569 Critical Analysis of Children's and Young Adult Literature 3 Prereq doctoral student. Multicultural analysis of children's and adolescent literature and its pedagogical and sociopolitical implications and possibilities.

570 Theory and Research in Electronic Literacies 3 . Ideas of literacy and effects of technology on literacy and policy, particularly those issues addressing diverse learners.

571 Elementary School Science 3 Prereq for candidates admitted to graduate teacher preparation. Theories and research underlying science programs with classroom implications.

572 Elementary School Science Methods 3 For candidates admitted to graduate teacher preparation. Theoretical base to design and implement appropriate standards-based elementary science instruction.

574 Science for All: An Individual and Multicultural Perspective 3 Prereq for candidates admitted to graduate teacher preparation. Implications of cultural and individual diversity for understanding western scientific and mathematical thought; an activity-based, educational perspective.

575 Globalization and Identity in Education 3 Issues relating to the complexities of globalization and identity in education.

576 Youth Cultures in Education 3 Analysis of how youth cultures operate in society and how they are practiced in schools.

577 Curriculum Theory 3 Curriculum theory as the interdisciplinary study of educational experience.

580 Multicultural Education in a Global Society 3 Graduate-level counterpart of T & L 480; additional requirements. Credit not granted for both T & L 480 and 580.

583 Problem Solving in Elementary and Middle Level Education 3 For candidates admitted to graduate teacher preparation. Integration of knowledge and skills to address complex cases in teaching and learning.

587 Environment, Culture and Education 3 Prereq graduate standing. Role of education in the social, ecological, and political conflicts between culture and environment.

588 Action Research: Teachers as Research 3 Theoretical concepts, research, issues, models, and strategies for implementation of action research.

589 Race, Identity and Representation in Education 3 Interdisciplinary research in race, identity and representations in education.

590 Internship V 2 (0-2) to 6 (0-18) May be repeated for credit; cumulative maximum 12 hours. By interview only. Opportunities in professional positions.

592 Social Theory in Education 3 Prereq doctoral student. Social theory and how it applies to intellectual work in education.

593 Pre-internship and Seminar 2 (1-3) Instructional practice in diverse classroom settings and reflection on that practice.

594 Integrating Fine Arts into K-8 Curriculum 2 Integrating Fine Arts (art, music, dance, drama) into K-8 curriculum; designed for pre-service MIT.

595 Internship and Seminar 10 (1-27) Instructional practice in classroom settings, reflection on practice; professional certification.

596 Topics in In-Service Education V 1-3 May be repeated for credit; cumulative maximum 12 hours. Prereq graduate standing or permission of instructor. Advanced study of research, practice, and contemporary issues in education.

597 Topics in In-Service Education V 1-3 May be repeated for credit; cumulative maximum 9 hours. New developments and applications on selected in-service and staff development topics.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Teaching and Learning - Language, Literacy and Technology

Degree offered: Doctor of Philosophy (Education)

Faculty working with graduate students: 4

Graduate students: 23

Deadline: Fall: January 10
Spring: July 1

Program Description

Our mission is to advance knowledge and ethical practice in the field of education. We do so through collaboration among universities, schools, families, and local, regional and global communities in a manner that reflects the ideals of democracy, social justice, and ecological sustainability.In brief, we offer teacher certification in elementary education (bachelor of arts in education, master in teaching) and secondary education (degree from major plus certification, master in teaching), and additional endorsements. We also offer professional certification, as well as a master of education (Ed.M.)and master of arts in education (M.A.) degrees. At the doctoral level, we offer two Pullman-based degrees. Those are the doctor of education(Ed.D.) in teacher leadership and the doctor of philosophy (Ph.D.) in education with specializations in cultural studies and social thought in education, language and literacy education, and special education.The research of our faculty contributes knowledge to our undergraduate and graduate programs and to the field of education in general.Our programs rely heavily on research-based, theoretical frameworks and the close connections we maintain with classroom teachers and other practitioners. We stress active engagement, critical problem-solving, and equity/fairness for all learners.

Degree Description

The Ph.D. specialization includes a common core of six courses in order to establish foundational knowledge and to ensure interaction with faculty in the specialization. Students gain a strong theoretical background while linking to current issues and practices. Students join a highly collaborative faculty who are committed to facilitating engaging, interactive, and current programs of study. Recent graduates are serving as education specialists in P-12 school districts and as faculty in research institutions. Full-time students may be offered positions as teaching and/or research assistants while pursuing their degrees.

Post-Graduate Employment Opportunities

faculty at research universities, clinical faculty, central administrator at K-12 school district, administrator at state educational agency or non-governmental organization.

Post-Graduate Career Placements

Teacher, specialist, researcher, faculty member at a research university

Contact Information

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Faculty

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EDRES

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565 Quantitative Research 3 Prereq EdPsy 508; EdRes/EdPsy 563. Statistical literacy in educational research; parametric and non-parametric methods.

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T & L

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525 Classroom Management Seminar V 2-3 Contemporary issues in management of elementary, middle school, and secondary classrooms; issues of abuse.

526 Research in Multicultural Education 3 Prereq either T & L 515 or by permission. Research and instructional practices focusing on multicultural education.

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595 Internship and Seminar 10 (1-27) Instructional practice in classroom settings, reflection on practice; professional certification.

596 Topics in In-Service Education V 1-3 May be repeated for credit; cumulative maximum 12 hours. Prereq graduate standing or permission of instructor. Advanced study of research, practice, and contemporary issues in education.

597 Topics in In-Service Education V 1-3 May be repeated for credit; cumulative maximum 9 hours. New developments and applications on selected in-service and staff development topics.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Teaching and Learning - Literacy Education

Degree offered: Master of Education

Faculty working with graduate students: 4

Graduate students: 75

Program offered: Pullman, Tri-Cities, Vancouver

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Program Description

Our mission is to advance knowledge and ethical practice in the field of education. We do so through collaboration among universities, schools, families, and local, regional and global communities in a manner that reflects the ideals of democracy, social justice, and ecological sustainability.In brief, we offer teacher certification in elementary education (bachelor of arts in education, master in teaching) and secondary education (degree from major plus certification, master in teaching), and additional endorsements. We also offer professional certification, as well as a master of education (Ed.M.)and master of arts in education (M.A.) degrees. At the doctoral level, we offer two Pullman-based degrees. Those are the doctor of education(Ed.D.) in teacher leadership and the doctor of philosophy (Ph.D.) in education with specializations in cultural studies and social thought in education, language and literacy education, and special education.The research of our faculty contributes knowledge to our undergraduate and graduate programs and to the field of education in general.Our programs rely heavily on research-based, theoretical frameworks and the close connections we maintain with classroom teachers and other practitioners. We stress active engagement, critical problem-solving, and equity/fairness for all learners.

Degree Description

The two master's degrees (Ed.M., M.A.) focus on literacy. The Ed.M. requires a culminating project. The M.A., a research-focused degree, requires a thesis. Teaching endorsements are available in reading and in ESL and may be a part of the master's degree coursework. Washington State's Professional Certification may be a part of the Ed.M. Faculty in the Language and Literacy PhD specialization have effectively combined the fields of literacy and language learning/ESL.

Post-Graduate Employment Opportunities

teaching, educational specialist, K-12 administration.

Post-Graduate Career Placements

Teacher, specialist,

Contact Information

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Faculty

Joy Egbert, David Johnson, Jane Kelley and Thomas Salsbury.

ED AD

501 Philosophy of Education 3 Development of American educational philosophy.

507 Social Foundations of Education 3 Educational adaptations to the economic and social trends and forces.

536 Introduction to Qualitative Research in Education 3 Prereq EdPsy 505. Introduction to the theory and methods of qualitative research; field relations, data collections, data analysis, hypothesis development, and theory generation.

EDPSY

502 Theoretical Foundations of Learning and Instruction 3 Historical and contemporary theories of learning and instruction: application of theory in counseling and teaching settings.

505 Research Methods I 3 Research methods; literature review; design, implementation, and interpretation of results.

508 Educational Statistics 3 Prereq EdPsy 505. Introductory course for graduate students in applied statistics for the behavioral sciences.

EDRES

562 Epistemology, Inquiry, and Representation 3 Prereq doctoral standing; EdPsy 505 or c//. Epistemological assumptions and methodological strategies of research.

563 Principles of Research 3 Prereq CoPsy 501 or EdRes 562 . The centrality of literature review and the understanding of methods used in educational research; practice in designing research questions.

564 Qualitative Research 3 Prereq EdRes 563. Theoretical underpinnings of qualitative research; familiarity with published qualitative research in education; practical research skills.

565 Quantitative Research 3 Prereq EdPsy 508; EdRes/EdPsy 563. Statistical literacy in educational research; parametric and non-parametric methods.

566 Research Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Prereq doctoral student. Presentation and analysis of research; professional development in research presentation.

Teaching And Learning

T & L

501 Bilingual/ESL Education 3 May be repeated for credit; cumulative maximum 6 hours. Work with students from diverse linguistic and cultural backgrounds in educational settings.

502 Assessment for Teaching and Learning V 2-3 Instruction in sound assessment practices for preservice and inservice graduate students.

503 ESL Methods and Material for Secondary Content Teachers 2 Research-based ESL strategies and methods for pre-service and secondary content area teachers.

504 Advanced Study in Linguistics for Educators 3 Prereq admission to T & L graduate program. Use of linguistics to better understand second language learning and teaching and the physical aspects of acquiring a language.

505 ESL Methods for General Educators (K-8) 2 Research-based ESL strategies and methods for pre-service and experienced teachers.

506 Multicultural Classroom Instruction and Management 4 Instructional and management strategies for maximizing students' opportunities to learn in a multicultural setting.

507 Seminar in Literacy in Multicultural Settings I 3 Multicultural perspective to curriculum development and classroom literacy practices.

508 Seminar in Literacy in Multicultural Settings II 3 Prereq T & L 507. Multicultural perspective to curriculum development and classroom literacy practices.

509 Research in Curriculum and Assessment for Bilingual/ESL Education 3 Prereq T & L 510 or 549. Research in curriculum development for and assessment of language minority students.

510 Theoretical Foundations of Bilingual/ESL Education 3 Prereq either T & L 333, T & L 335, or T & L 413. Graduate-level counterpart of T & L 410; additional requirements. Credit not granted for both T & L 410 and 510.

512 Language and Cultural Factors in Mathematics 3 Prereq graduate standing. Research and instructional strategies related to linguistic and cultural influences on learning math.

513 Seminar in Middle School Education 3 For experienced teachers. Curriculum patterns and recent research regarding instruction and materials in the contemporary middle school.

514 Methods and Materials for Bilingual/ESL Education 3 Prereq T & L 510 or T & L 549. For pre-service and experienced teachers. Graduate-level counterpart of T & L 414; additional requirements. Credit not granted for both T & L 414 and 514.

515 The Education of Cultural and Linguistic Minority Students 3 Issues in the education of language minority students.

516 Advanced Study in Computer-Assisted Language Learning 3 Prereq T & L 510 or T & L 549. Research, theory, and practice in computer-assisted language learning.

517 Educational Technology in K-8 Schools 2 (1-2) Prereq admission to MIT program. Technology standards for teachers, technology use in schools, production techniques and instructional methods.

518 Integrating Technology into the Curriculum 3 Examination and articulation of the potential for new technologies to expand learning opportunities.

519 Instructional Media Production I 3 Instructional media development, emphasizing the theory and methods of instructional design, digital media production and evaluation.

520 Topics in Special Student Populations V 1-4 May be repeated for credit; cumulative maximum 6 hours. For K-12 teachers. Knowledge of special student populations and guidance in developing appropriate curricula.

521 Topics in Education V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and/or applications in selected areas of education.

522 Topics in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

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525 Classroom Management Seminar V 2-3 Contemporary issues in management of elementary, middle school, and secondary classrooms; issues of abuse.

526 Research in Multicultural Education 3 Prereq either T & L 515 or by permission. Research and instructional practices focusing on multicultural education.

527 Seminar in Teacher Education Instruction 1 May be repeated for credit; cumulative maximum 4 hours. Teacher preparation program components and rationale, university teaching strategies, and evaluation methods.

528 Literacy within the Disciplines 3 Explores literacy research and practices that enhance the learning of various disciplines taught in K-12 settings.

529 Place-Based Education 3 Theory and practice of place-based education with an emphasis on community-based action research and curriculum planning.

530 Innovations in Reading 2 or 3 Graduate-level counterpart of T & L 431; additional requirements. Credit not granted for both T & L 431 and 530.

532 Children's Literature in the Curriculum 2 Theory and classroom applications for selecting and using literature and storytelling in content areas; reading, writing, language development, the arts.

533 Middle Level Mathematics Pedagogy and Philosophy 3 Middle-school philosophy; understanding of effective standards and research-based instructional methods.

535 Gender, Power and Education 3 Interdisciplinary focus on the relationships among gender, power and education.

536 Cultural Studies in Education 3 Historical and conceptual background of the field of cultural studies.

537 Seminar in Language, Literacy, and Culture 3 Interrelationships between schools, literacy, and student cultural background.

538 Writing Across the Curriculum 3 Writing for learning at grade levels K-12.

539 Innovations in Language Arts 3 The most recent developments in language arts instruction for pre-service and in-service teachers K-12.

540 Elementary School Social Studies 3 For candidates admitted to graduate teacher preparation and experienced teachers. Elementary structures of various social sciences; research findings related to instruction; classroom applications and materials.

541 Teacher Professional Certification: Pre-Assessment Seminar V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of ProCert application, Provisional Status/Employer Support verification (WAC 180-78A-505), and a copy of Residency Teaching Certificate. Candidates evaluate current teaching against standards to determine steps for professional growth plans which measure positive impact on student learning.

542 Teacher Professional Certification: Researching Exemplary Practices V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of T&L 541: Pre-Assessment Seminar. Teachers will apply exemplary practices, continue to assess their performance and college evidence of positive impact on student learning.

543 Teacher Professional Certification: Culminating Seminar V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of T & L 541(Pre-Assessment Seminar), Professional Growth Record initial activities approved, completed core credits, and Evidence/Artifacts gathered. Candidates will complete ProCert requirements to document positive impact on students' learning: set new goals; learn about National Board options.

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547 Teaching Folk Literature to Children and Adolescents 3 Folk literature as a genre in child and adolescent literature; curriculum applications; reading, language development, social studies, creative expression.

548 Teaching Adolescent Literature 3 Evaluating, selecting, and using literature for middle school and teenage students.

549 Communicating in a Multilingual Society 3 Prereq T & L 333, T & L 335, T & L 413 or graduate standing. Study of language in social and educational context and its relation to cultural and linguistic diversity.

550 Second Language Learning and Literacy 3 Prereq admission to doctoral program. Research on second language teaching and learning in literacy education with a focus on English language learners in US schools.

551 Psychology of Reading V 2-3 Psychological, perceptual, motivational, developmental and physiological aspects of reading.

552 Literacy Development I 3 For candidates admitted to graduate teacher preparation. Review of current research and approaches to instruction in the development of literacy in elementary and middle grades.

553 Assessment and Instruction for Reading: K-8 4 (3-3) Prereq T & L 307; T & L 321; T & L 322; T & L 551. Evaluation techniques and instructional practices for impacting the reading achievement of K-8 students.

554 Sociolinguistics 3 Prereq doctoral student. Interaction between language use and sociopolitical and cultural contexts; cultural and linguistic delivery and educational opportunity.

555 Seminar in Literacy Development 3 May be repeated for credit; cumulative maximum 6 hours. Current and historical research in reading/language arts, infancy through college and adult years; papers presented by faculty, invited speakers, and students.

556 Literacy Development II 3 Prereq for candidates admitted to graduate teacher preparation. Review of current research and approaches to instruction in the development of literacy in elementary and middle grades.

557 Research in Reading 3 Prereq EdPsy 505. Exploration of qualitative and quantitative reading research covering topics of current and historical importance.

558 Improving Comprehension through Literature 3 Key theoretical concepts and their implications for improved comprehension instruction, using children's literature.

559 Readings in Cultural Studies and Social Thought in Education 1 May be repeated for credit; cumulative maximum 3 hours. Current scholarship in the field of cultural studies in education and practices of schools.

560 Research in Teaching 3 May be repeated for credit; cumulative maximum 6 hours. Recent developments in research on teaching; both quantitative and qualitative research methodologies emphasized.

561 Elementary School Mathematics 3 Research on curriculum and instruction issues in elementary school mathematics.

564 Elementary School Mathematics Methods 3 For candidates admitted to graduate teacher preparation. Introduction to research, theory, and methods of teaching K-8 mathematics; emphasis on integrating theory and practice.

565 Introduction to Scholarly Inquiry 1 Prereq graduate standing. Introduction to the Ed.M program including the scholarship and research requirements and the role of students and action research.

566 Democratic Education 3 Prereq graduate standing. Rationale and skill to assist teachers in making classrooms more democratic.

567 Social Foundations of Literacy 3 Prereq admission to doctoral program. Social, cultural and political factors which influence the acquisition and use of literacy.

568 Psychological Foundations and Assessment of Literacy 3 Prereq admission to doctoral program. Historical look that blends the assessment of literacy and its psychological components.

569 Critical Analysis of Children's and Young Adult Literature 3 Prereq doctoral student. Multicultural analysis of children's and adolescent literature and its pedagogical and sociopolitical implications and possibilities.

570 Theory and Research in Electronic Literacies 3 . Ideas of literacy and effects of technology on literacy and policy, particularly those issues addressing diverse learners.

571 Elementary School Science 3 Prereq for candidates admitted to graduate teacher preparation. Theories and research underlying science programs with classroom implications.

572 Elementary School Science Methods 3 For candidates admitted to graduate teacher preparation. Theoretical base to design and implement appropriate standards-based elementary science instruction.

574 Science for All: An Individual and Multicultural Perspective 3 Prereq for candidates admitted to graduate teacher preparation. Implications of cultural and individual diversity for understanding western scientific and mathematical thought; an activity-based, educational perspective.

575 Globalization and Identity in Education 3 Issues relating to the complexities of globalization and identity in education.

576 Youth Cultures in Education 3 Analysis of how youth cultures operate in society and how they are practiced in schools.

577 Curriculum Theory 3 Curriculum theory as the interdisciplinary study of educational experience.

580 Multicultural Education in a Global Society 3 Graduate-level counterpart of T & L 480; additional requirements. Credit not granted for both T & L 480 and 580.

583 Problem Solving in Elementary and Middle Level Education 3 For candidates admitted to graduate teacher preparation. Integration of knowledge and skills to address complex cases in teaching and learning.

587 Environment, Culture and Education 3 Prereq graduate standing. Role of education in the social, ecological, and political conflicts between culture and environment.

588 Action Research: Teachers as Research 3 Theoretical concepts, research, issues, models, and strategies for implementation of action research.

589 Race, Identity and Representation in Education 3 Interdisciplinary research in race, identity and representations in education.

590 Internship V 2 (0-2) to 6 (0-18) May be repeated for credit; cumulative maximum 12 hours. By interview only. Opportunities in professional positions.

592 Social Theory in Education 3 Prereq doctoral student. Social theory and how it applies to intellectual work in education.

593 Pre-internship and Seminar 2 (1-3) Instructional practice in diverse classroom settings and reflection on that practice.

594 Integrating Fine Arts into K-8 Curriculum 2 Integrating Fine Arts (art, music, dance, drama) into K-8 curriculum; designed for pre-service MIT.

595 Internship and Seminar 10 (1-27) Instructional practice in classroom settings, reflection on practice; professional certification.

596 Topics in In-Service Education V 1-3 May be repeated for credit; cumulative maximum 12 hours. Prereq graduate standing or permission of instructor. Advanced study of research, practice, and contemporary issues in education.

597 Topics in In-Service Education V 1-3 May be repeated for credit; cumulative maximum 9 hours. New developments and applications on selected in-service and staff development topics.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Teaching and Learning - Special Education

Degree offered: Doctor of Education

Faculty working with graduate students: 6

Deadline: Fall: January 10
Spring: September 1

Program Description

Our mission is to advance knowledge and ethical practice in the field of education. We do so through collaboration among universities, schools, families, and local, regional and global communities in a manner that reflects the ideals of democracy, social justice, and ecological sustainability.In brief, we offer teacher certification in elementary education (bachelor of arts in education, master in teaching) and secondary education (degree from major plus certification, master in teaching), and additional endorsements. We also offer professional certification, as well as a master of education (Ed.M.)and master of arts in education (M.A.) degrees. At the doctoral level, we offer two Pullman-based degrees. Those are the doctor of education(Ed.D.) in teacher leadership and the doctor of philosophy (Ph.D.) in education with specializations in cultural studies and social thought in education, language and literacy education, and special education.The research of our faculty contributes knowledge to our undergraduate and graduate programs and to the field of education in general.Our programs rely heavily on research-based, theoretical frameworks and the close connections we maintain with classroom teachers and other practitioners. We stress active engagement, critical problem-solving, and equity/fairness for all learners.

Degree Description

The program in special education includes the study of response to intervention across the curriculum, diversity issues, social development and school based prevention practices for students with social and behavioral adjustment problems, universal design, and single subject design in addition to the comprehensive Carnegie core of research courses in quantitative, qualitative and program evaluation research methods.

Contact Information

Graduate Coordinator
Office of Graduate Studies
Washington State University
Cleveland Hall 252
PO Box 642114
Pullman, WA 99164-2114
Telephone: 509-335-9195
Fax: 509-335-2097
E-mail: gradstudies@wsu.edu

Faculty

Susan Banks, Michael Dunn, Henry Jackson, Matthew Marino, Darcy Miller and Paulette Mills.

EDRES

562 Epistemology, Inquiry, and Representation 3 Prereq doctoral standing; EdPsy 505 or c//. Epistemological assumptions and methodological strategies of research.

563 Principles of Research 3 Prereq CoPsy 501 or EdRes 562 . The centrality of literature review and the understanding of methods used in educational research; practice in designing research questions.

564 Qualitative Research 3 Prereq EdRes 563. Theoretical underpinnings of qualitative research; familiarity with published qualitative research in education; practical research skills.

565 Quantitative Research 3 Prereq EdPsy 508; EdRes/EdPsy 563. Statistical literacy in educational research; parametric and non-parametric methods.

566 Research Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Prereq doctoral student. Presentation and analysis of research; professional development in research presentation.

SP ED

501 Teaching Students with Disabilities 3 Prereq either Sp Ed 301, Sp Ed 420/520 or c//; c// in Sp Ed 590 for 2 credits. Graduate-level counterpart of Sp Ed 401; additional requirements. Credit not granted for both Sp Ed 401 and 501.

502 Assessment and Curriculum for Students with Disabilities 3 Prereq either Sp Ed 301, Sp Ed 420/520 or c//; c// in Sp Ed 590 for 2 credits. Graduate-level counterpart of Sp Ed 402; additional requirements. Credit not granted for both Sp Ed 402 and 502.

503 Secondary Special Education for Students with Disabilities 3 Prereq either Sp Ed 301, Sp Ed 420/520 or c//. Graduate-level counterpart of Sp Ed 403; additional requirements. Credit not granted for both Sp Ed 403 and 503.

504 Professional Skills in Special Education 3 Prereq either Sp Ed 301, Sp Ed 420/520 or c//. Graduate-level counterpart of Sp Ed 404; additional requirements. Credit not granted for both Sp Ed 404 and 504.

509 Early Childhood Special Education 3 Prereq either Sp Ed 301, Sp Ed 420/520 or c//. Graduate-level counterpart of Sp Ed 409; additional requirements. Credit not granted for both Sp Ed 409 and 509.

520 Teaching in Inclusive Classrooms V 2-3 Graduate-level counterpart of Sp Ed 420; additional requirements. Credit not granted for both Sp Ed 420 and 520.

521 Inclusion Strategies for Special Education Teachers 3 Prereq either Sp Ed 401/501 or c//. Graduate-level counterpart of Sp Ed 421; additional requirements. Credit not granted for both Sp Ed 421 and 521.

522 Topics in Special Education V 1-4 May be repeated for credit; cumulative maximum 8 hours. Recent research developments, issues and/or applications in selected areas of special education.

540 Methods in Intensive Educational Supports 3 Prereq either Sp Ed 301, Sp Ed 420/520 or c//. Graduate-level counterpart of Sp Ed 440; additional requirements. Credit not granted for both Sp Ed 440 and 540.

541 Foundations of Education of Children with Hearing Loss 2 Prereq admission to Preparing Educators of Children with Hearing Loss program. Historical and contemporary forces impacting education of children with hearing loss with emphasis on technology.

542 Development of Language for Teachers of Children with Hearing Loss 3 Prereq admission to Preparing Educators of Children with Hearing Loss program. Language from birth through school-age with emphasis on development and relationship of pragmatics, semantics and syntax.

543 Teaching Speech to Children with Hearing Loss 3 Prereq admission to Preparing Educators of Children with Hearing Loss program. Strategies for assessing, developing and remediating the speech of children with hearing loss.

544 Developing Language in Children with Hearing Loss 3 Prereq Sp Ed 542. Strategies for assessing and developing language in children with hearing loss.

545 Curriculum for Children with Hearing Loss 3 Prereq admission to Preparing Educators of Children with Hearing Loss program. Strategies for modifying and adapting instruction in academic areas to meet the needs to students with hearing loss.

546 Working with Parents of Children with Hearing Loss 3 Prereq admission to Preparing Educators of Children with Hearing Loss program. Impact of hearing loss on parents and strategies for helping parents cope at various stages of their child's life.

571 Prevention and Remediation of Reading Disabilities 3 Prereq either Sp Ed 301, Sp Ed 420/520, or c//. Theoretical concepts, research, and strategies of reading assessment and instruction for students with disabilities.

589 Seminar in Disability Studies 3 Current research, issues, trends in disabilities within the broader context of education, society, history.

590 Practicum in Special Education V 1-4 May be repeated for credit; cumulative maximum 8 hours. Supervised experiences in application of theories and practices in special education.

591 Response to Intervention Across the Core Academic Curriculum 3 Prereq doctoral student. New method of assessment for learning disability referred to as response to intervention.

592 Single Subject Research Design and Methods 3 Prereq doctoral student. In-depth study of single subject research designs; critical analysis of strengths and weaknesses of each design.

593 Diversity Issues in Special Education: Theory, Research and Practice 3 Prereq doctoral student. Diversity issues in special education examined and critically reflected upon for future use and practice.

594 Prevention and Intervention for Emotional and Behavioral Disorders (EBD) 3 Prereq doctoral student or by permission of instructor. Cross-disciplinary perspectives on preventing mental, emotional, and behavioral disorders; analysis of evidence-based practices, research to practice gap, implementation and sustainability.

595 Universal Design 3 Prereq doctoral student. Factors associated with developing, implementing and assessing curricular materials for individuals with disabilities.

596 Seminar in Quality Indicators for Research in Special Education 1 Prereq doctoral student. Co-requisite for research courses offered to all doctoral students.

Teaching And Learning

T & L

501 Bilingual/ESL Education 3 May be repeated for credit; cumulative maximum 6 hours. Work with students from diverse linguistic and cultural backgrounds in educational settings.

502 Assessment for Teaching and Learning V 2-3 Instruction in sound assessment practices for preservice and inservice graduate students.

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507 Seminar in Literacy in Multicultural Settings I 3 Multicultural perspective to curriculum development and classroom literacy practices.

508 Seminar in Literacy in Multicultural Settings II 3 Prereq T & L 507. Multicultural perspective to curriculum development and classroom literacy practices.

509 Research in Curriculum and Assessment for Bilingual/ESL Education 3 Prereq T & L 510 or 549. Research in curriculum development for and assessment of language minority students.

510 Theoretical Foundations of Bilingual/ESL Education 3 Prereq either T & L 333, T & L 335, or T & L 413. Graduate-level counterpart of T & L 410; additional requirements. Credit not granted for both T & L 410 and 510.

512 Language and Cultural Factors in Mathematics 3 Prereq graduate standing. Research and instructional strategies related to linguistic and cultural influences on learning math.

513 Seminar in Middle School Education 3 For experienced teachers. Curriculum patterns and recent research regarding instruction and materials in the contemporary middle school.

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515 The Education of Cultural and Linguistic Minority Students 3 Issues in the education of language minority students.

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525 Classroom Management Seminar V 2-3 Contemporary issues in management of elementary, middle school, and secondary classrooms; issues of abuse.

526 Research in Multicultural Education 3 Prereq either T & L 515 or by permission. Research and instructional practices focusing on multicultural education.

527 Seminar in Teacher Education Instruction 1 May be repeated for credit; cumulative maximum 4 hours. Teacher preparation program components and rationale, university teaching strategies, and evaluation methods.

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597 Topics in In-Service Education V 1-3 May be repeated for credit; cumulative maximum 9 hours. New developments and applications on selected in-service and staff development topics.

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800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Teaching and Learning - Special Education

Degree offered: Doctor of Philosophy (Education)

Faculty working with graduate students: 6

Graduate students: 5

Deadline: Fall: January 10
Spring: July 1

Program Description

Our mission is to advance knowledge and ethical practice in the field of education. We do so through collaboration among universities, schools, families, and local, regional and global communities in a manner that reflects the ideals of democracy, social justice, and ecological sustainability.In brief, we offer teacher certification in elementary education (bachelor of arts in education, master in teaching) and secondary education (degree from major plus certification, master in teaching), and additional endorsements. We also offer professional certification, as well as a master of education (Ed.M.)and master of arts in education (M.A.) degrees. At the doctoral level, we offer two Pullman-based degrees. Those are the doctor of education(Ed.D.) in teacher leadership and the doctor of philosophy (Ph.D.) in education with specializations in cultural studies and social thought in education, language and

literacy education, and special education.The research of our faculty contributes knowledge to our undergraduate and graduate programs and to the field of education in general.Our programs rely heavily on research-based, theoretical frameworks and the close connections we maintain with classroom teachers and other practitioners. We stress active engagement, critical problem-solving, and equity/fairness for all learners.

Degree Description

The Doctor of Philosophy (Ph.D.) prepares graduates for academic positions in research and teaching. The program in special education includes the study of response to intervention across the curriculum, diversity issues, social development and school based prevention practices for students with social and behavioral adjustment problems, universal design, and single subject design in addition to the comprehensive Carnegie core of research courses in quantitative, qualitative and program evaluation research methods.

Post-Graduate Employment Opportunities

faculty at a research university, clinical faculty, central administrator at K-12 school district, administrator at state educational agency.

Post-Graduate Career Placements

Teacher, faculty member at a research university

Contact Information

Graduate Coordinator
Office of Graduate Studies
Washington State University
Cleveland Hall 252
PO Box 642114
Pullman, WA 99164-2114
Telephone: 509-335-9195
Fax: 509-335-2097
E-mail: gradstudies@wsu.edu

Faculty

Susan Banks, Michael Dunn, Henry Jackson, Matthew Marino, Darcy Miller and Paulette Mills.

COPSY

542 Cross-cultural Research in Counseling and Assessment 3 Cross-cultural research methods, concepts, and findings in counseling and assessment.

ED AD

538 Special Topics in Qualitative Research in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq Ed Ad 536. May be repeated for credit; cumulative maximum 6 hours.

EDRES

562 Epistemology, Inquiry, and Representation 3 Prereq doctoral standing; EdPsy 505 or c//. Epistemological assumptions and methodological strategies of research.

563 Principles of Research 3 Prereq CoPsy 501 or EdRes 562 . The centrality of literature review and the understanding of methods used in educational research; practice in designing research questions.

564 Qualitative Research 3 Prereq EdRes 563. Theoretical underpinnings of qualitative research; familiarity with published qualitative research in education; practical research skills.

565 Quantitative Research 3 Prereq EdPsy 508; EdRes/EdPsy 563. Statistical literacy in educational research; parametric and non-parametric methods.

566 Research Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Prereq doctoral student. Presentation and analysis of research; professional development in research presentation.

SP ED

501 Teaching Students with Disabilities 3 Prereq either Sp Ed 301, Sp Ed 420/520 or c//; c// in Sp Ed 590 for 2 credits. Graduate-level counterpart of Sp Ed 401; additional requirements. Credit not granted for both Sp Ed 401 and 501.

502 Assessment and Curriculum for Students with Disabilities 3 Prereq either Sp Ed 301, Sp Ed 420/520 or c//; c// in Sp Ed 590 for 2 credits. Graduate-level counterpart of Sp Ed 402; additional requirements. Credit not granted for both Sp Ed 402 and 502.

503 Secondary Special Education for Students with Disabilities 3 Prereq either Sp Ed 301, Sp Ed 420/520 or c//. Graduate-level counterpart of Sp Ed 403; additional requirements. Credit not granted for both Sp Ed 403 and 503.

504 Professional Skills in Special Education 3 Prereq either Sp Ed 301, Sp Ed 420/520 or c//. Graduate-level counterpart of Sp Ed 404; additional requirements. Credit not granted for both Sp Ed 404 and 504.

509 Early Childhood Special Education 3 Prereq either Sp Ed 301, Sp Ed 420/520 or c//. Graduate-level counterpart of Sp Ed 409; additional requirements. Credit not granted for both Sp Ed 409 and 509.

520 Teaching in Inclusive Classrooms V 2-3 Graduate-level counterpart of Sp Ed 420; additional requirements. Credit not granted for both Sp Ed 420 and 520.

521 Inclusion Strategies for Special Education Teachers 3 Prereq either Sp Ed 401/501 or c//. Graduate-level counterpart of Sp Ed 421; additional requirements. Credit not granted for both Sp Ed 421 and 521.

522 Topics in Special Education V 1-4 May be repeated for credit; cumulative maximum 8 hours. Recent research developments, issues and/or applications in selected areas of special education.

540 Methods in Intensive Educational Supports 3 Prereq either Sp Ed 301, Sp Ed 420/520 or c//. Graduate-level counterpart of Sp Ed 440; additional requirements. Credit not granted for both Sp Ed 440 and 540.

541 Foundations of Education of Children with Hearing Loss 2 Prereq admission to Preparing Educators of Children with Hearing Loss program. Historical and contemporary forces impacting education of children with hearing loss with emphasis on technology.

542 Development of Language for Teachers of Children with Hearing Loss 3 Prereq admission to Preparing Educators of Children with Hearing Loss program. Language from birth through school-age with emphasis on development and relationship of pragmatics, semantics and syntax.

543 Teaching Speech to Children with Hearing Loss 3 Prereq admission to Preparing Educators of Children with Hearing Loss program. Strategies for assessing, developing and remediating the speech of children with hearing loss.

544 Developing Language in Children with Hearing Loss 3 Prereq Sp Ed 542. Strategies for assessing and developing language in children with hearing loss.

545 Curriculum for Children with Hearing Loss 3 Prereq admission to Preparing Educators of Children with Hearing Loss program. Strategies for modifying and adapting instruction in academic areas to meet the needs to students with hearing loss.

546 Working with Parents of Children with Hearing Loss 3 Prereq admission to Preparing Educators of Children with Hearing Loss program. Impact of hearing loss on parents and strategies for helping parents cope at various stages of their child's life.

571 Prevention and Remediation of Reading Disabilities 3 Prereq either Sp Ed 301, Sp Ed 420/520, or c//. Theoretical concepts, research, and strategies of reading assessment and instruction for students with disabilities.

589 Seminar in Disability Studies 3 Current research, issues, trends in disabilities within the broader context of education, society, history.

590 Practicum in Special Education V 1-4 May be repeated for credit; cumulative maximum 8 hours. Supervised experiences in application of theories and practices in special education.

591 Response to Intervention Across the Core Academic Curriculum 3 Prereq doctoral student. New method of assessment for learning disability referred to as response to intervention.

592 Single Subject Research Design and Methods 3 Prereq doctoral student. In-depth study of single subject research designs; critical analysis of strengths and weaknesses of each design.

593 Diversity Issues in Special Education: Theory, Research and Practice 3 Prereq doctoral student. Diversity issues in special education examined and critically reflected upon for future use and practice.

594 Prevention and Intervention for Emotional and Behavioral Disorders (EBD) 3 Prereq doctoral student or by permission of instructor. Cross-disciplinary perspectives on preventing mental, emotional, and behavioral disorders; analysis of evidence-based practices, research to practice gap, implementation and sustainability.

595 Universal Design 3 Prereq doctoral student. Factors associated with developing, implementing and assessing curricular materials for individuals with disabilities.

596 Seminar in Quality Indicators for Research in Special Education 1 Prereq doctoral student. Co-requisite for research courses offered to all doctoral students.

Teaching And Learning

T & L

501 Bilingual/ESL Education 3 May be repeated for credit; cumulative maximum 6 hours. Work with students from diverse linguistic and cultural backgrounds in educational settings.

502 Assessment for Teaching and Learning V 2-3 Instruction in sound assessment practices for preservice and inservice graduate students.

503 ESL Methods and Material for Secondary Content Teachers 2 Research-based ESL strategies and methods for pre-service and secondary content area teachers.

504 Advanced Study in Linguistics for Educators 3 Prereq admission to T & L graduate program. Use of linguistics to better understand second language learning and teaching and the physical aspects of acquiring a language.

505 ESL Methods for General Educators (K-8) 2 Research-based ESL strategies and methods for pre-service and experienced teachers.

506 Multicultural Classroom Instruction and Management 4 Instructional and management strategies for maximizing students' opportunities to learn in a multicultural setting.

507 Seminar in Literacy in Multicultural Settings I 3 Multicultural perspective to curriculum development and classroom literacy practices.

508 Seminar in Literacy in Multicultural Settings II 3 Prereq T & L 507. Multicultural perspective to curriculum development and classroom literacy practices.

509 Research in Curriculum and Assessment for Bilingual/ESL Education 3 Prereq T & L 510 or 549. Research in curriculum development for and assessment of language minority students.

510 Theoretical Foundations of Bilingual/ESL Education 3 Prereq either T & L 333, T & L 335, or T & L 413. Graduate-level counterpart of T & L 410; additional requirements. Credit not granted for both T & L 410 and 510.

512 Language and Cultural Factors in Mathematics 3 Prereq graduate standing. Research and instructional strategies related to linguistic and cultural influences on learning math.

513 Seminar in Middle School Education 3 For experienced teachers. Curriculum patterns and recent research regarding instruction and materials in the contemporary middle school.

514 Methods and Materials for Bilingual/ESL Education 3 Prereq T & L 510 or T & L 549. For pre-service and experienced teachers. Graduate-level counterpart of T & L 414; additional requirements. Credit not granted for both T & L 414 and 514.

515 The Education of Cultural and Linguistic Minority Students 3 Issues in the education of language minority students.

516 Advanced Study in Computer-Assisted Language Learning 3 Prereq T & L 510 or T & L 549. Research, theory, and practice in computer-assisted language learning.

517 Educational Technology in K-8 Schools 2 (1-2) Prereq admission to MIT program. Technology standards for teachers, technology use in schools, production techniques and instructional methods.

518 Integrating Technology into the Curriculum 3 Examination and articulation of the potential for new technologies to expand learning opportunities.

519 Instructional Media Production I 3 Instructional media development, emphasizing the theory and methods of instructional design, digital media production and evaluation.

520 Topics in Special Student Populations V 1-4 May be repeated for credit; cumulative maximum 6 hours. For K-12 teachers. Knowledge of special student populations and guidance in developing appropriate curricula.

521 Topics in Education V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and/or applications in selected areas of education.

522 Topics in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

523 Topics in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

524 Topics in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

525 Classroom Management Seminar V 2-3 Contemporary issues in management of elementary, middle school, and secondary classrooms; issues of abuse.

526 Research in Multicultural Education 3 Prereq either T & L 515 or by permission. Research and instructional practices focusing on multicultural education.

527 Seminar in Teacher Education Instruction 1 May be repeated for credit; cumulative maximum 4 hours. Teacher preparation program components and rationale, university teaching strategies, and evaluation methods.

528 Literacy within the Disciplines 3 Explores literacy research and practices that enhance the learning of various disciplines taught in K-12 settings.

529 Place-Based Education 3 Theory and practice of place-based education with an emphasis on community-based action research and curriculum planning.

530 Innovations in Reading 2 or 3 Graduate-level counterpart of T & L 431; additional requirements. Credit not granted for both T & L 431 and 530.

532 Children's Literature in the Curriculum 2 Theory and classroom applications for selecting and using literature and storytelling in content areas; reading, writing, language development, the arts.

535 Gender, Power and Education 3 Interdisciplinary focus on the relationships among gender, power and education.

536 Cultural Studies in Education 3 Historical and conceptual background of the field of cultural studies.

537 Seminar in Language, Literacy, and Culture 3 Interrelationships between schools, literacy, and student cultural background.

538 Writing Across the Curriculum 3 Writing for learning at grade levels K-12.

539 Innovations in Language Arts 3 The most recent developments in language arts instruction for pre-service and in-service teachers K-12.

540 Elementary School Social Studies 3 For candidates admitted to graduate teacher preparation and experienced teachers. Elementary structures of various social sciences; research findings related to instruction; classroom applications and materials.

541 Teacher Professional Certification: Pre-Assessment Seminar V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of ProCert application, Provisional Status/Employer Support verification (WAC 180-78A-505), and a copy of Residency Teaching Certificate. Candidates evaluate current teaching against standards to determine steps for professional growth plans which measure positive impact on student learning.

542 Teacher Professional Certification: Researching Exemplary Practices V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of T&L 541: Pre-Assessment Seminar. Teachers will apply exemplary practices, continue to assess their performance and college evidence of positive impact on student learning.

543 Teacher Professional Certification: Culminating Seminar V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of T & L 541(Pre-Assessment Seminar), Professional Growth Record initial activities approved, completed core credits, and Evidence/Artifacts gathered. Candidates will complete ProCert requirements to document positive impact on students' learning: set new goals; learn about National Board options.

544 Advanced Children's Literature 3 Trends, issues, and research in children's literature.

546 Teaching Writing in the Elementary School 3 Theory and research relevant to instructional approaches and practices for teaching writing in elementary schools.

547 Teaching Folk Literature to Children and Adolescents 3 Folk literature as a genre in child and adolescent literature; curriculum applications; reading, language development, social studies, creative expression.

548 Teaching Adolescent Literature 3 Evaluating, selecting, and using literature for middle school and teenage students.

549 Communicating in a Multilingual Society 3 Prereq T & L 333, T & L 335, T & L 413 or graduate standing. Study of language in social and educational context and its relation to cultural and linguistic diversity.

550 Second Language Learning and Literacy 3 Prereq admission to doctoral program. Research on second language teaching and learning in literacy education with a focus on English language learners in US schools.

551 Psychology of Reading V 2-3 Psychological, perceptual, motivational, developmental and physiological aspects of reading.

552 Literacy Development I 3 For candidates admitted to graduate teacher preparation. Review of current research and approaches to instruction in the development of literacy in elementary and middle grades.

553 Assessment and Instruction for Reading: K-8 4 (3-3) Prereq T & L 307; T & L 321; T & L 322; T & L 551. Evaluation techniques and instructional practices for impacting the reading achievement of K-8 students.

554 Sociolinguistics 3 Prereq doctoral student. Interaction between language use and sociopolitical and cultural contexts; cultural and linguistic delivery and educational opportunity.

555 Seminar in Literacy Development 3 May be repeated for credit; cumulative maximum 6 hours. Current and historical research in reading/language arts, infancy through college and adult years; papers presented by faculty, invited speakers, and students.

556 Literacy Development II 3 Prereq for candidates admitted to graduate teacher preparation. Review of current research and approaches to instruction in the development of literacy in elementary and middle grades.

557 Research in Reading 3 Prereq EdPsy 505. Exploration of qualitative and quantitative reading research covering topics of current and historical importance.

558 Improving Comprehension through Literature 3 Key theoretical concepts and their implications for improved comprehension instruction, using children's literature.

559 Readings in Cultural Studies and Social Thought in Education 1 May be repeated for credit; cumulative maximum 3 hours. Current scholarship in the field of cultural studies in education and practices of schools.

560 Research in Teaching 3 May be repeated for credit; cumulative maximum 6 hours. Recent developments in research on teaching; both quantitative and qualitative research methodologies emphasized.

561 Elementary School Mathematics 3 Research on curriculum and instruction issues in elementary school mathematics.

564 Elementary School Mathematics Methods 3 For candidates admitted to graduate teacher preparation. Introduction to research, theory, and methods of teaching K-8 mathematics; emphasis on integrating theory and practice.

565 Introduction to Scholarly Inquiry 1 Prereq graduate standing. Introduction to the Ed.M program including the scholarship and research requirements and the role of students and action research.

566 Democratic Education 3 Prereq graduate standing. Rationale and skill to assist teachers in making classrooms more democratic.

567 Social Foundations of Literacy 3 Prereq admission to doctoral program. Social, cultural and political factors which influence the acquisition and use of literacy.

568 Psychological Foundations and Assessment of Literacy 3 Prereq admission to doctoral program. Historical look that blends the assessment of literacy and its psychological components.

569 Critical Analysis of Children's and Young Adult Literature 3 Prereq doctoral student. Multicultural analysis of children's and adolescent literature and its pedagogical and sociopolitical implications and possibilities.

570 Theory and Research in Electronic Literacies 3 . Ideas of literacy and effects of technology on literacy and policy, particularly those issues addressing diverse learners.

571 Elementary School Science 3 Prereq for candidates admitted to graduate teacher preparation. Theories and research underlying science programs with classroom implications.

572 Elementary School Science Methods 3 For candidates admitted to graduate teacher preparation. Theoretical base to design and implement appropriate standards-based elementary science instruction.

574 Science for All: An Individual and Multicultural Perspective 3 Prereq for candidates admitted to graduate teacher preparation. Implications of cultural and individual diversity for understanding western scientific and mathematical thought; an activity-based, educational perspective.

575 Globalization and Identity in Education 3 Issues relating to the complexities of globalization and identity in education.

576 Youth Cultures in Education 3 Analysis of how youth cultures operate in society and how they are practiced in schools.

577 Curriculum Theory 3 Curriculum theory as the interdisciplinary study of educational experience.

580 Multicultural Education in a Global Society 3 Graduate-level counterpart of T & L 480; additional requirements. Credit not granted for both T & L 480 and 580.

583 Problem Solving in Elementary and Middle Level Education 3 For candidates admitted to graduate teacher preparation. Integration of knowledge and skills to address complex cases in teaching and learning.

587 Environment, Culture and Education 3 Prereq graduate standing. Role of education in the social, ecological, and political conflicts between culture and environment.

588 Action Research: Teachers as Research 3 Theoretical concepts, research, issues, models, and strategies for implementation of action research.

589 Race, Identity and Representation in Education 3 Interdisciplinary research in race, identity and representations in education.

590 Internship V 2 (0-2) to 6 (0-18) May be repeated for credit; cumulative maximum 12 hours. By interview only. Opportunities in professional positions.

592 Social Theory in Education 3 Prereq doctoral student. Social theory and how it applies to intellectual work in education.

593 Pre-internship and Seminar 2 (1-3) Instructional practice in diverse classroom settings and reflection on that practice.

594 Integrating Fine Arts into K-8 Curriculum 2 Integrating Fine Arts (art, music, dance, drama) into K-8 curriculum; designed for pre-service MIT.

595 Internship and Seminar 10 (1-27) Instructional practice in classroom settings, reflection on practice; professional certification.

596 Topics in In-Service Education V 1-3 May be repeated for credit; cumulative maximum 12 hours. Prereq graduate standing or permission of instructor. Advanced study of research, practice, and contemporary issues in education.

597 Topics in In-Service Education V 1-3 May be repeated for credit; cumulative maximum 9 hours. New developments and applications on selected in-service and staff development topics.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Teaching and Learning - Special Education

Degree offered: Master of Education

Faculty working with graduate students: 6

Graduate students: 31

Program offered: Pullman, Spokane, Vancouver

Deadline: Fall: January 10
Spring: September 1

Program Description

Our mission is to advance knowledge and ethical practice in the field of education. We do so through collaboration among universities, schools, families, and local, regional and global communities in a manner that reflects the ideals of democracy, social justice, and ecological sustainability.In brief, we offer teacher certification in elementary education (bachelor of arts in education, master in teaching) and secondary education (degree from major plus certification, master in teaching), and additional endorsements. We also offer professional certification, as well as a master of education (Ed.M.)and master of arts in education (M.A.) degrees. At the doctoral level, we offer two Pullman-based degrees. Those are the doctor of education(Ed.D.) in teacher leadership and the doctor of philosophy (Ph.D.) in education with specializations in cultural studies and social thought in education, language and literacy education, and special education.The research of our faculty contributes knowledge to our undergraduate and graduate programs and to the field of education in general.Our programs rely heavily on research-based, theoretical frameworks and the close connections we maintain with classroom teachers and other practitioners. We stress active engagement, critical problem-solving, and equity/fairness for all learners.

Degree Description

The Ed.M. allows students to study a variety of education-related areas within structured coursework. The program in special education includes the study of response to intervention across the curriculum, diversity issues, social development and school based prevention practices for students with social and behavioral adjustment problems, universal design, and single subject design in addition to the comprehensive Carnegie core of research courses in quantitative, qualitative and program evaluation research methods.

Post-Graduate Employment Opportunities

teaching, educational specialist, K-12 administration

Post-Graduate Career Placements

Teacher

Contact Information

Graduate Coordinator
Office of Graduate Studies
Washington State University
Cleveland Hall 252
PO Box 642114
Pullman, WA 99164-2114
Telephone: 509-335-9195
Fax: 509-335-2097
E-mail: gradstudies@wsu.edu

Faculty

Susan Banks, Michael Dunn, Henry Jackson, Matthew Marino, Darcy Miller and Paulette Mills.

ED AD

501 Philosophy of Education 3 Development of American educational philosophy.

507 Social Foundations of Education 3 Educational adaptations to the economic and social trends and forces.

536 Introduction to Qualitative Research in Education 3 Prereq EdPsy 505. Introduction to the theory and methods of qualitative research; field relations, data collections, data analysis, hypothesis development, and theory generation.

EDPSY

502 Theoretical Foundations of Learning and Instruction 3 Historical and contemporary theories of learning and instruction: application of theory in counseling and teaching settings.

505 Research Methods I 3 Research methods; literature review; design, implementation, and interpretation of results.

508 Educational Statistics 3 Prereq EdPsy 505. Introductory course for graduate students in applied statistics for the behavioral sciences.

EDRES

562 Epistemology, Inquiry, and Representation 3 Prereq doctoral standing; EdPsy 505 or c//. Epistemological assumptions and methodological strategies of research.

563 Principles of Research 3 Prereq CoPsy 501 or EdRes 562 . The centrality of literature review and the understanding of methods used in educational research; practice in designing research questions.

564 Qualitative Research 3 Prereq EdRes 563. Theoretical underpinnings of qualitative research; familiarity with published qualitative research in education; practical research skills.

565 Quantitative Research 3 Prereq EdPsy 508; EdRes/EdPsy 563. Statistical literacy in educational research; parametric and non-parametric methods.

566 Research Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Prereq doctoral student. Presentation and analysis of research; professional development in research presentation.

SP ED

501 Teaching Students with Disabilities 3 Prereq either Sp Ed 301, Sp Ed 420/520 or c//; c// in Sp Ed 590 for 2 credits. Graduate-level counterpart of Sp Ed 401; additional requirements. Credit not granted for both Sp Ed 401 and 501.

502 Assessment and Curriculum for Students with Disabilities 3 Prereq either Sp Ed 301, Sp Ed 420/520 or c//; c// in Sp Ed 590 for 2 credits. Graduate-level counterpart of Sp Ed 402; additional requirements. Credit not granted for both Sp Ed 402 and 502.

503 Secondary Special Education for Students with Disabilities 3 Prereq either Sp Ed 301, Sp Ed 420/520 or c//. Graduate-level counterpart of Sp Ed 403; additional requirements. Credit not granted for both Sp Ed 403 and 503.

504 Professional Skills in Special Education 3 Prereq either Sp Ed 301, Sp Ed 420/520 or c//. Graduate-level counterpart of Sp Ed 404; additional requirements. Credit not granted for both Sp Ed 404 and 504.

509 Early Childhood Special Education 3 Prereq either Sp Ed 301, Sp Ed 420/520 or c//. Graduate-level counterpart of Sp Ed 409; additional requirements. Credit not granted for both Sp Ed 409 and 509.

520 Teaching in Inclusive Classrooms V 2-3 Graduate-level counterpart of Sp Ed 420; additional requirements. Credit not granted for both Sp Ed 420 and 520.

521 Inclusion Strategies for Special Education Teachers 3 Prereq either Sp Ed 401/501 or c//. Graduate-level counterpart of Sp Ed 421; additional requirements. Credit not granted for both Sp Ed 421 and 521.

522 Topics in Special Education V 1-4 May be repeated for credit; cumulative maximum 8 hours. Recent research developments, issues and/or applications in selected areas of special education.

540 Methods in Intensive Educational Supports 3 Prereq either Sp Ed 301, Sp Ed 420/520 or c//. Graduate-level counterpart of Sp Ed 440; additional requirements. Credit not granted for both Sp Ed 440 and 540.

541 Foundations of Education of Children with Hearing Loss 2 Prereq admission to Preparing Educators of Children with Hearing Loss program. Historical and contemporary forces impacting education of children with hearing loss with emphasis on technology.

542 Development of Language for Teachers of Children with Hearing Loss 3 Prereq admission to Preparing Educators of Children with Hearing Loss program. Language from birth through school-age with emphasis on development and relationship of pragmatics, semantics and syntax.

543 Teaching Speech to Children with Hearing Loss 3 Prereq admission to Preparing Educators of Children with Hearing Loss program. Strategies for assessing, developing and remediating the speech of children with hearing loss.

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545 Curriculum for Children with Hearing Loss 3 Prereq admission to Preparing Educators of Children with Hearing Loss program. Strategies for modifying and adapting instruction in academic areas to meet the needs to students with hearing loss.

546 Working with Parents of Children with Hearing Loss 3 Prereq admission to Preparing Educators of Children with Hearing Loss program. Impact of hearing loss on parents and strategies for helping parents cope at various stages of their child's life.

571 Prevention and Remediation of Reading Disabilities 3 Prereq either Sp Ed 301, Sp Ed 420/520, or c//. Theoretical concepts, research, and strategies of reading assessment and instruction for students with disabilities.

589 Seminar in Disability Studies 3 Current research, issues, trends in disabilities within the broader context of education, society, history.

590 Practicum in Special Education V 1-4 May be repeated for credit; cumulative maximum 8 hours. Supervised experiences in application of theories and practices in special education.

591 Response to Intervention Across the Core Academic Curriculum 3 Prereq doctoral student. New method of assessment for learning disability referred to as response to intervention.

592 Single Subject Research Design and Methods 3 Prereq doctoral student. In-depth study of single subject research designs; critical analysis of strengths and weaknesses of each design.

593 Diversity Issues in Special Education: Theory, Research and Practice 3 Prereq doctoral student. Diversity issues in special education examined and critically reflected upon for future use and practice.

594 Prevention and Intervention for Emotional and Behavioral Disorders (EBD) 3 Prereq doctoral student or by permission of instructor. Cross-disciplinary perspectives on preventing mental, emotional, and behavioral disorders; analysis of evidence-based practices, research to practice gap, implementation and sustainability.

595 Universal Design 3 Prereq doctoral student. Factors associated with developing, implementing and assessing curricular materials for individuals with disabilities.

596 Seminar in Quality Indicators for Research in Special Education 1 Prereq doctoral student. Co-requisite for research courses offered to all doctoral students.

Teaching And Learning

T & L

501 Bilingual/ESL Education 3 May be repeated for credit; cumulative maximum 6 hours. Work with students from diverse linguistic and cultural backgrounds in educational settings.

502 Assessment for Teaching and Learning V 2-3 Instruction in sound assessment practices for preservice and inservice graduate students.

503 ESL Methods and Material for Secondary Content Teachers 2 Research-based ESL strategies and methods for pre-service and secondary content area teachers.

504 Advanced Study in Linguistics for Educators 3 Prereq admission to T & L graduate program. Use of linguistics to better understand second language learning and teaching and the physical aspects of acquiring a language.

505 ESL Methods for General Educators (K-8) 2 Research-based ESL strategies and methods for pre-service and experienced teachers.

506 Multicultural Classroom Instruction and Management 4 Instructional and management strategies for maximizing students' opportunities to learn in a multicultural setting.

507 Seminar in Literacy in Multicultural Settings I 3 Multicultural perspective to curriculum development and classroom literacy practices.

508 Seminar in Literacy in Multicultural Settings II 3 Prereq T & L 507. Multicultural perspective to curriculum development and classroom literacy practices.

509 Research in Curriculum and Assessment for Bilingual/ESL Education 3 Prereq T & L 510 or 549. Research in curriculum development for and assessment of language minority students.

510 Theoretical Foundations of Bilingual/ESL Education 3 Prereq either T & L 333, T & L 335, or T & L 413. Graduate-level counterpart of T & L 410; additional requirements. Credit not granted for both T & L 410 and 510.

512 Language and Cultural Factors in Mathematics 3 Prereq graduate standing. Research and instructional strategies related to linguistic and cultural influences on learning math.

513 Seminar in Middle School Education 3 For experienced teachers. Curriculum patterns and recent research regarding instruction and materials in the contemporary middle school.

514 Methods and Materials for Bilingual/ESL Education 3 Prereq T & L 510 or T & L 549. For pre-service and experienced teachers. Graduate-level counterpart of T & L 414; additional requirements. Credit not granted for both T & L 414 and 514.

515 The Education of Cultural and Linguistic Minority Students 3 Issues in the education of language minority students.

516 Advanced Study in Computer-Assisted Language Learning 3 Prereq T & L 510 or T & L 549. Research, theory, and practice in computer-assisted language learning.

517 Educational Technology in K-8 Schools 2 (1-2) Prereq admission to MIT program. Technology standards for teachers, technology use in schools, production techniques and instructional methods.

518 Integrating Technology into the Curriculum 3 Examination and articulation of the potential for new technologies to expand learning opportunities.

519 Instructional Media Production I 3 Instructional media development, emphasizing the theory and methods of instructional design, digital media production and evaluation.

520 Topics in Special Student Populations V 1-4 May be repeated for credit; cumulative maximum 6 hours. For K-12 teachers. Knowledge of special student populations and guidance in developing appropriate curricula.

521 Topics in Education V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and/or applications in selected areas of education.

522 Topics in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

523 Topics in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

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525 Classroom Management Seminar V 2-3 Contemporary issues in management of elementary, middle school, and secondary classrooms; issues of abuse.

526 Research in Multicultural Education 3 Prereq either T & L 515 or by permission. Research and instructional practices focusing on multicultural education.

527 Seminar in Teacher Education Instruction 1 May be repeated for credit; cumulative maximum 4 hours. Teacher preparation program components and rationale, university teaching strategies, and evaluation methods.

528 Literacy within the Disciplines 3 Explores literacy research and practices that enhance the learning of various disciplines taught in K-12 settings.

529 Place-Based Education 3 Theory and practice of place-based education with an emphasis on community-based action research and curriculum planning.

530 Innovations in Reading 2 or 3 Graduate-level counterpart of T & L 431; additional requirements. Credit not granted for both T & L 431 and 530.

532 Children's Literature in the Curriculum 2 Theory and classroom applications for selecting and using literature and storytelling in content areas; reading, writing, language development, the arts.

533 Middle Level Mathematics Pedagogy and Philosophy 3 Middle-school philosophy; understanding of effective standards and research-based instructional methods.

535 Gender, Power and Education 3 Interdisciplinary focus on the relationships among gender, power and education.

536 Cultural Studies in Education 3 Historical and conceptual background of the field of cultural studies.

537 Seminar in Language, Literacy, and Culture 3 Interrelationships between schools, literacy, and student cultural background.

538 Writing Across the Curriculum 3 Writing for learning at grade levels K-12.

539 Innovations in Language Arts 3 The most recent developments in language arts instruction for pre-service and in-service teachers K-12.

540 Elementary School Social Studies 3 For candidates admitted to graduate teacher preparation and experienced teachers. Elementary structures of various social sciences; research findings related to instruction; classroom applications and materials.

541 Teacher Professional Certification: Pre-Assessment Seminar V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of ProCert application, Provisional Status/Employer Support verification (WAC 180-78A-505), and a copy of Residency Teaching Certificate. Candidates evaluate current teaching against standards to determine steps for professional growth plans which measure positive impact on student learning.

542 Teacher Professional Certification: Researching Exemplary Practices V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of T&L 541: Pre-Assessment Seminar. Teachers will apply exemplary practices, continue to assess their performance and college evidence of positive impact on student learning.

543 Teacher Professional Certification: Culminating Seminar V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of T & L 541(Pre-Assessment Seminar), Professional Growth Record initial activities approved, completed core credits, and Evidence/Artifacts gathered. Candidates will complete ProCert requirements to document positive impact on students' learning: set new goals; learn about National Board options.

544 Advanced Children's Literature 3 Trends, issues, and research in children's literature.

546 Teaching Writing in the Elementary School 3 Theory and research relevant to instructional approaches and practices for teaching writing in elementary schools.

547 Teaching Folk Literature to Children and Adolescents 3 Folk literature as a genre in child and adolescent literature; curriculum applications; reading, language development, social studies, creative expression.

548 Teaching Adolescent Literature 3 Evaluating, selecting, and using literature for middle school and teenage students.

549 Communicating in a Multilingual Society 3 Prereq T & L 333, T & L 335, T & L 413 or graduate standing. Study of language in social and educational context and its relation to cultural and linguistic diversity.

550 Second Language Learning and Literacy 3 Prereq admission to doctoral program. Research on second language teaching and learning in literacy education with a focus on English language learners in US schools.

551 Psychology of Reading V 2-3 Psychological, perceptual, motivational, developmental and physiological aspects of reading.

552 Literacy Development I 3 For candidates admitted to graduate teacher preparation. Review of current research and approaches to instruction in the development of literacy in elementary and middle grades.

553 Assessment and Instruction for Reading: K-8 4 (3-3) Prereq T & L 307; T & L 321; T & L 322; T & L 551. Evaluation techniques and instructional practices for impacting the reading achievement of K-8 students.

554 Sociolinguistics 3 Prereq doctoral student. Interaction between language use and sociopolitical and cultural contexts; cultural and linguistic delivery and educational opportunity.

555 Seminar in Literacy Development 3 May be repeated for credit; cumulative maximum 6 hours. Current and historical research in reading/language arts, infancy through college and adult years; papers presented by faculty, invited speakers, and students.

556 Literacy Development II 3 Prereq for candidates admitted to graduate teacher preparation. Review of current research and approaches to instruction in the development of literacy in elementary and middle grades.

557 Research in Reading 3 Prereq EdPsy 505. Exploration of qualitative and quantitative reading research covering topics of current and historical importance.

558 Improving Comprehension through Literature 3 Key theoretical concepts and their implications for improved comprehension instruction, using children's literature.

559 Readings in Cultural Studies and Social Thought in Education 1 May be repeated for credit; cumulative maximum 3 hours. Current scholarship in the field of cultural studies in education and practices of schools.

560 Research in Teaching 3 May be repeated for credit; cumulative maximum 6 hours. Recent developments in research on teaching; both quantitative and qualitative research methodologies emphasized.

561 Elementary School Mathematics 3 Research on curriculum and instruction issues in elementary school mathematics.

564 Elementary School Mathematics Methods 3 For candidates admitted to graduate teacher preparation. Introduction to research, theory, and methods of teaching K-8 mathematics; emphasis on integrating theory and practice.

565 Introduction to Scholarly Inquiry 1 Prereq graduate standing. Introduction to the Ed.M program including the scholarship and research requirements and the role of students and action research.

566 Democratic Education 3 Prereq graduate standing. Rationale and skill to assist teachers in making classrooms more democratic.

567 Social Foundations of Literacy 3 Prereq admission to doctoral program. Social, cultural and political factors which influence the acquisition and use of literacy.

568 Psychological Foundations and Assessment of Literacy 3 Prereq admission to doctoral program. Historical look that blends the assessment of literacy and its psychological components.

569 Critical Analysis of Children's and Young Adult Literature 3 Prereq doctoral student. Multicultural analysis of children's and adolescent literature and its pedagogical and sociopolitical implications and possibilities.

570 Theory and Research in Electronic Literacies 3 . Ideas of literacy and effects of technology on literacy and policy, particularly those issues addressing diverse learners.

571 Elementary School Science 3 Prereq for candidates admitted to graduate teacher preparation. Theories and research underlying science programs with classroom implications.

572 Elementary School Science Methods 3 For candidates admitted to graduate teacher preparation. Theoretical base to design and implement appropriate standards-based elementary science instruction.

574 Science for All: An Individual and Multicultural Perspective 3 Prereq for candidates admitted to graduate teacher preparation. Implications of cultural and individual diversity for understanding western scientific and mathematical thought; an activity-based, educational perspective.

575 Globalization and Identity in Education 3 Issues relating to the complexities of globalization and identity in education.

576 Youth Cultures in Education 3 Analysis of how youth cultures operate in society and how they are practiced in schools.

577 Curriculum Theory 3 Curriculum theory as the interdisciplinary study of educational experience.

580 Multicultural Education in a Global Society 3 Graduate-level counterpart of T & L 480; additional requirements. Credit not granted for both T & L 480 and 580.

583 Problem Solving in Elementary and Middle Level Education 3 For candidates admitted to graduate teacher preparation. Integration of knowledge and skills to address complex cases in teaching and learning.

587 Environment, Culture and Education 3 Prereq graduate standing. Role of education in the social, ecological, and political conflicts between culture and environment.

588 Action Research: Teachers as Research 3 Theoretical concepts, research, issues, models, and strategies for implementation of action research.

589 Race, Identity and Representation in Education 3 Interdisciplinary research in race, identity and representations in education.

590 Internship V 2 (0-2) to 6 (0-18) May be repeated for credit; cumulative maximum 12 hours. By interview only. Opportunities in professional positions.

592 Social Theory in Education 3 Prereq doctoral student. Social theory and how it applies to intellectual work in education.

593 Pre-internship and Seminar 2 (1-3) Instructional practice in diverse classroom settings and reflection on that practice.

594 Integrating Fine Arts into K-8 Curriculum 2 Integrating Fine Arts (art, music, dance, drama) into K-8 curriculum; designed for pre-service MIT.

595 Internship and Seminar 10 (1-27) Instructional practice in classroom settings, reflection on practice; professional certification.

596 Topics in In-Service Education V 1-3 May be repeated for credit; cumulative maximum 12 hours. Prereq graduate standing or permission of instructor. Advanced study of research, practice, and contemporary issues in education.

597 Topics in In-Service Education V 1-3 May be repeated for credit; cumulative maximum 9 hours. New developments and applications on selected in-service and staff development topics.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Teaching and Learning - Teacher Leadership

Degree offered: Doctor of Education

Faculty working with graduate students: 6

Graduate students: 24

Program offered: Pullman, Spokane, Tri-Cities, Vancouver

Deadline: Fall: January 10
Spring: July 1

Program Description

Our mission is to advance knowledge and ethical practice in the field of education. We do so through collaboration among universities, schools, families, and local, regional and global communities in a manner that reflects the ideals of democracy, social justice, and ecological sustainability.In brief, we offer teacher certification in elementary education (bachelor of arts in education, master in teaching) and secondary education (degree from major plus certification, master in teaching), and additional endorsements. We also offer professional certification, as well as a master of education (Ed.M.)and master of arts in education (M.A.) degrees. At the doctoral level, we offer two Pullman-based degrees. Those are the doctor of education(Ed.D.) in teacher leadership and the doctor of philosophy (Ph.D.) in education with specializations in cultural studies and social thought in education, language and literacy education, and special education.The research of our faculty contributes knowledge to our undergraduate and graduate programs and to the field of education in general.Our programs rely heavily on research-based, theoretical frameworks and the close connections we maintain with classroom teachers and other practitioners. We stress active engagement, critical problem-solving, and equity/fairness for all learners.

Degree Description

The four-campus Ed.D. with a specialization in Teacher Leadership is designed to prepare K-16 educators for intellectual and practical leadership within classrooms, schools, districts, and the larger educational policy arena. The program is built on an inquiry stance where students draw from theory, research, and practical experiences to investigate local and statewide teaching and learning programs and practices. Goals for Ed.D. students include generation of applicable knowledge as well as practical recommendations and solutions for complex educational problems, including those related to equity and diversity. Coursework will be centered around a series of both collaborative and individual projects that build from critical examination of participants' work and contexts. Program participants will broaden their capacity for instructional and programmatic leadership in both formal and informal roles within schools, districts, and educational communities.

As part of a larger Ed.D. Program, the Teacher Leadership specialization will also provide students with opportunities to collaborate with educational professionals in educational administration and from community colleges.

Post-Graduate Employment Opportunities

Positions as administrative and instructional leaders in educational institutions or related organizations (e.g., faculty/staff developer, curriculum director, teacher leader).

Contact Information

Graduate Coordinator
Office of Graduate Studies
Washington State University
Cleveland Hall 252
PO Box 642114
Pullman, WA 99164-2114
Telephone: 509-335-9195
Fax: 509-335-2097
E-mail: gradstudies@wsu.edu

Faculty

Gisela Ernst-Slavit, Janet Frost, Eric Johnson, Tonda Liggett, Paula Price and Richard Sawyer.

ED AD

514 Basic Principles of Curriculum Design V 2-3 The application of theoretical concepts and approaches in the planning and design of curricula.

522 Topics in Education V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and /or applications in selected areas of education.

EDPSY

570 Introduction to Program Evaluation 3 Prereq EdPsy 505. Introduction to strategies and techniques for evaluation of educational and social programs.

EDRES

563 Principles of Research 3 Prereq CoPsy 501 or EdRes 562 . The centrality of literature review and the understanding of methods used in educational research; practice in designing research questions.

564 Qualitative Research 3 Prereq EdRes 563. Theoretical underpinnings of qualitative research; familiarity with published qualitative research in education; practical research skills.

565 Quantitative Research 3 Prereq EdPsy 508; EdRes/EdPsy 563. Statistical literacy in educational research; parametric and non-parametric methods.

SP ED

589 Seminar in Disability Studies 3 Current research, issues, trends in disabilities within the broader context of education, society, history.

Teaching And Learning

T & L

501 Bilingual/ESL Education 3 May be repeated for credit; cumulative maximum 6 hours. Work with students from diverse linguistic and cultural backgrounds in educational settings.

502 Assessment for Teaching and Learning V 2-3 Instruction in sound assessment practices for preservice and inservice graduate students.

503 ESL Methods and Material for Secondary Content Teachers 2 Research-based ESL strategies and methods for pre-service and secondary content area teachers.

504 Advanced Study in Linguistics for Educators 3 Prereq admission to T & L graduate program. Use of linguistics to better understand second language learning and teaching and the physical aspects of acquiring a language.

505 ESL Methods for General Educators (K-8) 2 Research-based ESL strategies and methods for pre-service and experienced teachers.

506 Multicultural Classroom Instruction and Management 4 Instructional and management strategies for maximizing students' opportunities to learn in a multicultural setting.

507 Seminar in Literacy in Multicultural Settings I 3 Multicultural perspective to curriculum development and classroom literacy practices.

508 Seminar in Literacy in Multicultural Settings II 3 Prereq T & L 507. Multicultural perspective to curriculum development and classroom literacy practices.

509 Research in Curriculum and Assessment for Bilingual/ESL Education 3 Prereq T & L 510 or 549. Research in curriculum development for and assessment of language minority students.

510 Theoretical Foundations of Bilingual/ESL Education 3 Prereq either T & L 333, T & L 335, or T & L 413. Graduate-level counterpart of T & L 410; additional requirements. Credit not granted for both T & L 410 and 510.

512 Language and Cultural Factors in Mathematics 3 Prereq graduate standing. Research and instructional strategies related to linguistic and cultural influences on learning math.

513 Seminar in Middle School Education 3 For experienced teachers. Curriculum patterns and recent research regarding instruction and materials in the contemporary middle school.

514 Methods and Materials for Bilingual/ESL Education 3 Prereq T & L 510 or T & L 549. For pre-service and experienced teachers. Graduate-level counterpart of T & L 414; additional requirements. Credit not granted for both T & L 414 and 514.

515 The Education of Cultural and Linguistic Minority Students 3 Issues in the education of language minority students.

516 Advanced Study in Computer-Assisted Language Learning 3 Prereq T & L 510 or T & L 549. Research, theory, and practice in computer-assisted language learning.

517 Educational Technology in K-8 Schools 2 (1-2) Prereq admission to MIT program. Technology standards for teachers, technology use in schools, production techniques and instructional methods.

518 Integrating Technology into the Curriculum 3 Examination and articulation of the potential for new technologies to expand learning opportunities.

519 Instructional Media Production I 3 Instructional media development, emphasizing the theory and methods of instructional design, digital media production and evaluation.

520 Topics in Special Student Populations V 1-4 May be repeated for credit; cumulative maximum 6 hours. For K-12 teachers. Knowledge of special student populations and guidance in developing appropriate curricula.

521 Topics in Education V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and/or applications in selected areas of education.

522 Topics in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

523 Topics in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

524 Topics in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

525 Classroom Management Seminar V 2-3 Contemporary issues in management of elementary, middle school, and secondary classrooms; issues of abuse.

526 Research in Multicultural Education 3 Prereq either T & L 515 or by permission. Research and instructional practices focusing on multicultural education.

527 Seminar in Teacher Education Instruction 1 May be repeated for credit; cumulative maximum 4 hours. Teacher preparation program components and rationale, university teaching strategies, and evaluation methods.

528 Literacy within the Disciplines 3 Explores literacy research and practices that enhance the learning of various disciplines taught in K-12 settings.

529 Place-Based Education 3 Theory and practice of place-based education with an emphasis on community-based action research and curriculum planning.

530 Innovations in Reading 2 or 3 Graduate-level counterpart of T & L 431; additional requirements. Credit not granted for both T & L 431 and 530.

532 Children's Literature in the Curriculum 2 Theory and classroom applications for selecting and using literature and storytelling in content areas; reading, writing, language development, the arts.

535 Gender, Power and Education 3 Interdisciplinary focus on the relationships among gender, power and education.

536 Cultural Studies in Education 3 Historical and conceptual background of the field of cultural studies.

537 Seminar in Language, Literacy, and Culture 3 Interrelationships between schools, literacy, and student cultural background.

538 Writing Across the Curriculum 3 Writing for learning at grade levels K-12.

539 Innovations in Language Arts 3 The most recent developments in language arts instruction for pre-service and in-service teachers K-12.

540 Elementary School Social Studies 3 For candidates admitted to graduate teacher preparation and experienced teachers. Elementary structures of various social sciences; research findings related to instruction; classroom applications and materials.

541 Teacher Professional Certification: Pre-Assessment Seminar V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of ProCert application, Provisional Status/Employer Support verification (WAC 180-78A-505), and a copy of Residency Teaching Certificate. Candidates evaluate current teaching against standards to determine steps for professional growth plans which measure positive impact on student learning.

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543 Teacher Professional Certification: Culminating Seminar V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of T & L 541(Pre-Assessment Seminar), Professional Growth Record initial activities approved, completed core credits, and Evidence/Artifacts gathered. Candidates will complete ProCert requirements to document positive impact on students' learning: set new goals; learn about National Board options.

544 Advanced Children's Literature 3 Trends, issues, and research in children's literature.

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554 Sociolinguistics 3 Prereq doctoral student. Interaction between language use and sociopolitical and cultural contexts; cultural and linguistic delivery and educational opportunity.

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556 Literacy Development II 3 Prereq for candidates admitted to graduate teacher preparation. Review of current research and approaches to instruction in the development of literacy in elementary and middle grades.

557 Research in Reading 3 Prereq EdPsy 505. Exploration of qualitative and quantitative reading research covering topics of current and historical importance.

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565 Introduction to Scholarly Inquiry 1 Prereq graduate standing. Introduction to the Ed.M program including the scholarship and research requirements and the role of students and action research.

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570 Theory and Research in Electronic Literacies 3 . Ideas of literacy and effects of technology on literacy and policy, particularly those issues addressing diverse learners.

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574 Science for All: An Individual and Multicultural Perspective 3 Prereq for candidates admitted to graduate teacher preparation. Implications of cultural and individual diversity for understanding western scientific and mathematical thought; an activity-based, educational perspective.

575 Globalization and Identity in Education 3 Issues relating to the complexities of globalization and identity in education.

576 Youth Cultures in Education 3 Analysis of how youth cultures operate in society and how they are practiced in schools.

577 Curriculum Theory 3 Curriculum theory as the interdisciplinary study of educational experience.

580 Multicultural Education in a Global Society 3 Graduate-level counterpart of T & L 480; additional requirements. Credit not granted for both T & L 480 and 580.

583 Problem Solving in Elementary and Middle Level Education 3 For candidates admitted to graduate teacher preparation. Integration of knowledge and skills to address complex cases in teaching and learning.

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589 Race, Identity and Representation in Education 3 Interdisciplinary research in race, identity and representations in education.

590 Internship V 2 (0-2) to 6 (0-18) May be repeated for credit; cumulative maximum 12 hours. By interview only. Opportunities in professional positions.

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593 Pre-internship and Seminar 2 (1-3) Instructional practice in diverse classroom settings and reflection on that practice.

594 Integrating Fine Arts into K-8 Curriculum 2 Integrating Fine Arts (art, music, dance, drama) into K-8 curriculum; designed for pre-service MIT.

595 Internship and Seminar 10 (1-27) Instructional practice in classroom settings, reflection on practice; professional certification.

596 Topics in In-Service Education V 1-3 May be repeated for credit; cumulative maximum 12 hours. Prereq graduate standing or permission of instructor. Advanced study of research, practice, and contemporary issues in education.

597 Topics in In-Service Education V 1-3 May be repeated for credit; cumulative maximum 9 hours. New developments and applications on selected in-service and staff development topics.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Teaching and Learning - Teaching (elementary)

Degree offered: Master in Teaching

Faculty working with graduate students: 22

Graduate students: 42

Program offered: Pullman, Spokane, Vancouver

Deadline: Fall: November 15
Spring: July 1

Program Description

Our mission is to advance knowledge and ethical practice in the field of education. We do so through collaboration among universities, schools, families, and local, regional and global communities in a manner that reflects the ideals of democracy, social justice, and ecological sustainability.In brief, we offer teacher certification in elementary education (bachelor of arts in education, master in teaching) and secondary education (degree from major plus certification, master in teaching), and additional endorsements. We also offer professional certification, as well as a master of education (Ed.M.)and master of arts in education (M.A.) degrees. At the doctoral level, we offer two Pullman-based degrees. Those are the doctor of education(Ed.D.) in teacher leadership and the doctor of philosophy (Ph.D.) in education with specializations in cultural studies and social thought in education, language and literacy education, and special education.The research of our faculty contributes knowledge to our undergraduate and graduate programs and to the field of education in general.Our programs rely heavi-

ly on research-based, theoretical frameworks and the close connections we maintain with classroom teachers and other practitioners. We stress active engagement, critical problem-solving, and equity/fairness for all learners.

Degree Description

The MIT is intended for those who possess a bachelor's degree in a field other than education and is designed to prepare students to become effective elementary or secondary education teachers. This program of study leads to a master's degree and a State of Washington elementary or secondary education teaching certificate. The MIT degree is available to students the Pullman, Spokane, and Vancouver campuses; however the programs differ slightly from campus to campus. The programs at the Vancouver campus consist of 15 months of intensive study and internships. The program on the Pullman/Spokane campuses consists of 13 months of intensive study and internships to complete teacher certification with additional time to complete the masters project. All of the MIT programs are cohort-based, forming a supportive network. The program consists of a wide range of pedagogy course work. Depending on the student's focus (elementary or secondary education), these courses may include literacy, social studies, science, math, reading, health, fitness, or fine arts methods. Students also study diversity in schools and society, educational technology, the social context of education, and research-based effective practices. When successfully completed, the MIT program results in a master's degree and teacher certification. Therefore all MIT students complete both certification and graduate research courses. All MIT students complete a research project and present the project results at the culmination of their program. The research projects are usually aimed at examining teaching and educational issues, with the focus on understanding the positive impact of education on student learning.

Post-Graduate Employment Opportunities

Elementary Education TeacherSecondary Education TeacherSchool/Curriculum Leadership PositionsAgency Services Positions

Post-Graduate Career Placements

Elementary EducationSecondary EducationDirector of Preschool Programs

Contact Information

Graduate Coordinator
Office of Graduate Studies
Washington State University
Cleveland Hall 252
PO Box 642114
Pullman, WA 99164-2114
Telephone: 509-335-9195
Fax: 509-335-2097
E-mail: gradstudies@wsu.edu

MIT Program Coordinator
Master in Teaching Elementary Program
Washington State University - Vancouver
14204 NE Salmon Creek Avenue
Vancouver, WA 98686
Telephone: 360-546-9673

Faculty

Tariq Akmal, Susan Banks, Pamela Bettis, Michael Dunn, Joy Egbert, Gisela Ernst-Slavit, Janet Frost, Leslie Hall, Michael Hayes, Leslie Huff, Henry Jackson, David Johnson, Eric Johnson, Tonda Liggett, Matthew Marino, Darcy Miller, Paulette Mills, Jo Olson, Paula Price, Thomas Salsbury, Pauline Sameshima and Dawn Shinew.

ED AD

506 Social Context of Education 2 The interpretation of social context issues including historical, legal and cultural factors as these influence policies and practice in education.

EDPSY

503 Advanced Educational Psychology 2 Theories of learning and development as applied to education.

EDRES

562 Epistemology, Inquiry, and Representation 3 Prereq doctoral standing; EdPsy 505 or c//. Epistemological assumptions and methodological strategies of research.

563 Principles of Research 3 Prereq CoPsy 501 or EdRes 562 . The centrality of literature review and the understanding of methods used in educational research; practice in designing research questions.

564 Qualitative Research 3 Prereq EdRes 563. Theoretical underpinnings of qualitative research; familiarity with published qualitative research in education; practical research skills.

565 Quantitative Research 3 Prereq EdPsy 508; EdRes/EdPsy 563. Statistical literacy in educational research; parametric and non-parametric methods.

566 Research Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Prereq doctoral student. Presentation and analysis of research; professional development in research presentation.

KIN

586 Methods of Health and Physical Education 2 Physical activity and health promotion for school programs, and educational/legal issues on physical and sexual abuse, K-8.

SP ED

520 Teaching in Inclusive Classrooms V 2-3 Graduate-level counterpart of Sp Ed 420; additional requirements. Credit not granted for both Sp Ed 420 and 520.

Teaching And Learning

T & L

501 Bilingual/ESL Education 3 May be repeated for credit; cumulative maximum 6 hours. Work with students from diverse linguistic and cultural backgrounds in educational settings.

502 Assessment for Teaching and Learning V 2-3 Instruction in sound assessment practices for preservice and inservice graduate students.

503 ESL Methods and Material for Secondary Content Teachers 2 Research-based ESL strategies and methods for pre-service and secondary content area teachers.

504 Advanced Study in Linguistics for Educators 3 Prereq admission to T & L graduate program. Use of linguistics to better understand second language learning and teaching and the physical aspects of acquiring a language.

505 ESL Methods for General Educators (K-8) 2 Research-based ESL strategies and methods for pre-service and experienced teachers.

506 Multicultural Classroom Instruction and Management 4 Instructional and management strategies for maximizing students' opportunities to learn in a multicultural setting.

507 Seminar in Literacy in Multicultural Settings I 3 Multicultural perspective to curriculum development and classroom literacy practices.

508 Seminar in Literacy in Multicultural Settings II 3 Prereq T & L 507. Multicultural perspective to curriculum development and classroom literacy practices.

509 Research in Curriculum and Assessment for Bilingual/ESL Education 3 Prereq T & L 510 or 549. Research in curriculum development for and assessment of language minority students.

510 Theoretical Foundations of Bilingual/ESL Education 3 Prereq either T & L 333, T & L 335, or T & L 413. Graduate-level counterpart of T & L 410; additional requirements. Credit not granted for both T & L 410 and 510.

512 Language and Cultural Factors in Mathematics 3 Prereq graduate standing. Research and instructional strategies related to linguistic and cultural influences on learning math.

513 Seminar in Middle School Education 3 For experienced teachers. Curriculum patterns and recent research regarding instruction and materials in the contemporary middle school.

514 Methods and Materials for Bilingual/ESL Education 3 Prereq T & L 510 or T & L 549. For pre-service and experienced teachers. Graduate-level counterpart of T & L 414; additional requirements. Credit not granted for both T & L 414 and 514.

515 The Education of Cultural and Linguistic Minority Students 3 Issues in the education of language minority students.

516 Advanced Study in Computer-Assisted Language Learning 3 Prereq T & L 510 or T & L 549. Research, theory, and practice in computer-assisted language learning.

517 Educational Technology in K-8 Schools 2 (1-2) Prereq admission to MIT program. Technology standards for teachers, technology use in schools, production techniques and instructional methods.

518 Integrating Technology into the Curriculum 3 Examination and articulation of the potential for new technologies to expand learning opportunities.

519 Instructional Media Production I 3 Instructional media development, emphasizing the theory and methods of instructional design, digital media production and evaluation.

520 Topics in Special Student Populations V 1-4 May be repeated for credit; cumulative maximum 6 hours. For K-12 teachers. Knowledge of special student populations and guidance in developing appropriate curricula.

521 Topics in Education V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and/or applications in selected areas of education.

522 Topics in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

523 Topics in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

524 Topics in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

525 Classroom Management Seminar V 2-3 Contemporary issues in management of elementary, middle school, and secondary classrooms; issues of abuse.

526 Research in Multicultural Education 3 Prereq either T & L 515 or by permission. Research and instructional practices focusing on multicultural education.

527 Seminar in Teacher Education Instruction 1 May be repeated for credit; cumulative maximum 4 hours. Teacher preparation program components and rationale, university teaching strategies, and evaluation methods.

528 Literacy within the Disciplines 3 Explores literacy research and practices that enhance the learning of various disciplines taught in K-12 settings.

529 Place-Based Education 3 Theory and practice of place-based education with an emphasis on community-based action research and curriculum planning.

530 Innovations in Reading 2 or 3 Graduate-level counterpart of T & L 431; additional requirements. Credit not granted for both T & L 431 and 530.

532 Children's Literature in the Curriculum 2 Theory and classroom applications for selecting and using literature and storytelling in content areas; reading, writing, language development, the arts.

533 Middle Level Mathematics Pedagogy and Philosophy 3 Middle-school philosophy; understanding of effective standards and research-based instructional methods.

535 Gender, Power and Education 3 Interdisciplinary focus on the relationships among gender, power and education.

536 Cultural Studies in Education 3 Historical and conceptual background of the field of cultural studies.

537 Seminar in Language, Literacy, and Culture 3 Interrelationships between schools, literacy, and student cultural background.

538 Writing Across the Curriculum 3 Writing for learning at grade levels K-12.

539 Innovations in Language Arts 3 The most recent developments in language arts instruction for pre-service and in-service teachers K-12.

540 Elementary School Social Studies 3 For candidates admitted to graduate teacher preparation and experienced teachers. Elementary structures of various social sciences; research findings related to instruction; classroom applications and materials.

541 Teacher Professional Certification: Pre-Assessment Seminar V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of Pro-Cert application, Provisional Status/Employer Support verification (WAC 180-78A-505), and a copy of Residency Teaching Certificate. Candidates evaluate current teaching against standards to determine steps for professional growth plans which measure positive impact on student learning.

542 Teacher Professional Certification: Researching Exemplary Practices V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of T&L 541: Pre-Assessment Seminar. Teachers will apply exemplary practices, continue to assess their performance and college evidence of positive impact on student learning.

543 Teacher Professional Certification: Culminating Seminar V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of T & L 541(Pre-Assessment Seminar), Professional Growth Record initial activities approved, completed core credits, and Evidence/Artifacts gathered. Candidates will complete ProCert requirements to document positive impact on students' learning: set new goals; learn about National Board options.

544 Advanced Children's Literature 3 Trends, issues, and research in children's literature.

546 Teaching Writing in the Elementary School 3 Theory and research relevant to instructional approaches and practices for teaching writing in elementary schools.

547 Teaching Folk Literature to Children and Adolescents 3 Folk literature as a genre in child and adolescent literature; curriculum applications; reading, language development, social studies, creative expression.

548 Teaching Adolescent Literature 3 Evaluating, selecting, and using literature for middle school and teenage students.

549 Communicating in a Multilingual Society 3 Prereq T & L 333, T & L 335, T & L 413 or graduate standing. Study of language in social and educational context and its relation to cultural and linguistic diversity.

550 Second Language Learning and Literacy 3 Prereq admission to doctoral program. Research on second language teaching and learning in literacy education with a focus on English language learners in US schools.

551 Psychology of Reading V 2-3 Psychological, perceptual, motivational, developmental and physiological aspects of reading.

552 Literacy Development I 3 For candidates admitted to graduate teacher preparation. Review of current research and approaches to instruction in the development of literacy in elementary and middle grades.

553 Assessment and Instruction for Reading: K-8 4 (3-3) Prereq T & L 307; T & L 321; T & L 322; T & L 551. Evaluation techniques and instructional practices for impacting the reading achievement of K-8 students.

554 Sociolinguistics 3 Prereq doctoral student. Interaction between language use and sociopolitical and cultural contexts; cultural and linguistic delivery and educational opportunity.

555 Seminar in Literacy Development 3 May be repeated for credit; cumulative maximum 6 hours. Current and historical research in reading/language arts, infancy through college and adult years; papers presented by faculty, invited speakers, and students.

556 Literacy Development II 3 Prereq for candidates admitted to graduate teacher preparation. Review of current research and approaches to instruction in the development of literacy in elementary and middle grades.

557 Research in Reading 3 Prereq EdPsy 505. Exploration of qualitative and quantitative reading research covering topics of current and historical importance.

558 Improving Comprehension through Literature 3 Key theoretical concepts and their implications for improved comprehension instruction, using children's literature.

559 Readings in Cultural Studies and Social Thought in Education 1 May be repeated for credit; cumulative maximum 3 hours. Current scholarship in the field of cultural studies in education and practices of schools.

560 Research in Teaching 3 May be repeated for credit; cumulative maximum 6 hours. Recent developments in research on teaching; both quantitative and qualitative research methodologies emphasized.

561 Elementary School Mathematics 3 Research on curriculum and instruction issues in elementary school mathematics.

564 Elementary School Mathematics Methods 3 For candidates admitted to graduate teacher preparation. Introduction to research, theory, and methods of teaching K-8 mathematics; emphasis on integrating theory and practice.

565 Introduction to Scholarly Inquiry 1 Prereq graduate standing. Introduction to the Ed.M program including the scholarship and research requirements and the role of students and action research.

566 Democratic Education 3 Prereq graduate standing. Rationale and skill to assist teachers in making classrooms more democratic.

567 Social Foundations of Literacy 3 Prereq admission to doctoral program. Social, cultural and political factors which influence the acquisition and use of literacy.

568 Psychological Foundations and Assessment of Literacy 3 Prereq admission to doctoral program. Historical look that blends the assessment of literacy and its psychological components.

569 Critical Analysis of Children's and Young Adult Literature 3 Prereq doctoral student. Multicultural analysis of children's and adolescent literature and its pedagogical and sociopolitical implications and possibilities.

570 Theory and Research in Electronic Literacies 3 . Ideas of literacy and effects of technology on literacy and policy, particularly those issues addressing diverse learners.

571 Elementary School Science 3 Prereq for candidates admitted to graduate teacher preparation. Theories and research underlying science programs with classroom implications.

572 Elementary School Science Methods 3 For candidates admitted to graduate teacher preparation. Theoretical base to design and implement appropriate standards-based elementary science instruction.

574 Science for All: An Individual and Multicultural Perspective 3 Prereq for candidates admitted to graduate teacher preparation. Implications of cultural and individual diversity for understanding western scientific and mathematical thought; an activity-based, educational perspective.

575 Globalization and Identity in Education 3 Issues relating to the complexities of globalization and identity in education.

576 Youth Cultures in Education 3 Analysis of how youth cultures operate in society and how they are practiced in schools.

577 Curriculum Theory 3 Curriculum theory as the interdisciplinary study of educational experience.

580 Multicultural Education in a Global Society 3 Graduate-level counterpart of T & L 480; additional requirements. Credit not granted for both T & L 480 and 580.

583 Problem Solving in Elementary and Middle Level Education 3 For candidates admitted to graduate teacher preparation. Integration of knowledge and skills to address complex cases in teaching and learning.

587 Environment, Culture and Education 3 Prereq graduate standing. Role of education in the social, ecological, and political conflicts between culture and environment.

588 Action Research: Teachers as Research 3 Theoretical concepts, research, issues, models, and strategies for implementation of action research.

589 Race, Identity and Representation in Education 3 Interdisciplinary research in race, identity and representations in education.

590 Internship V 2 (0-2) to 6 (0-18) May be repeated for credit; cumulative maximum 12 hours. By interview only. Opportunities in professional positions.

592 Social Theory in Education 3 Prereq doctoral student. Social theory and how it applies to intellectual work in education.

593 Pre-internship and Seminar 2 (1-3) Instructional practice in diverse classroom settings and reflection on that practice.

594 Integrating Fine Arts into K-8 Curriculum 2 Integrating Fine Arts (art, music, dance, drama) into K-8 curriculum; designed for pre-service MIT.

595 Internship and Seminar 10 (1-27) Instructional practice in classroom settings, reflection on practice; professional certification.

596 Topics in In-Service Education V 1-3 May be repeated for credit; cumulative maximum 12 hours. Prereq graduate standing or permission of instructor. Advanced study of research, practice, and contemporary issues in education.

597 Topics in In-Service Education V 1-3 May be repeated for credit; cumulative maximum 9 hours. New developments and applications on selected in-service and staff development topics.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Teaching and Learning - Teaching (secondary)

Degree offered: Master in Teaching

Faculty working with graduate students: 23

Graduate students: 44

Program offered: Pullman, Spokane, Vancouver

Deadline: Fall: November 15
Spring: July 1

Program Description

Our mission is to advance knowledge and ethical practice in the field of education. We do so through collaboration among universities, schools, families, and local, regional and global communities in a manner that reflects the ideals of democracy, social justice, and ecological sustainability.In brief, we offer teacher certification in elementary education (bachelor of arts in education, master in teaching) and secondary education (degree from major plus certification, master in teaching), and additional endorsements. We also offer professional certification, as well as a master of education (Ed.M.)and master of arts in education (M.A.) degrees. At the doctoral level, we offer two Pullman-based degrees. Those are the doctor of education(Ed.D.) in teacher leadership and the doctor of philosophy (Ph.D.) in education with specializations in cultural studies and social thought in education, language and literacy education, and special education.The research of our faculty contributes knowledge to our undergraduate and graduate programs and to the field of education in general.Our programs rely heavily on research-based, theoretical frameworks and the close connections we maintain with classroom teachers and other practitioners. We stress active engagement, critical problem-solving, and equity/fairness for all learners.

Degree Description

The MIT is intended for those who possess a bachelor's degree in a field other than education and is designed to prepare students to become effective elementary or secondary education teachers. This program of study leads to a master's degree and a State of Washington elementary or secondary education teaching certificate. The MIT degree is available to students the Pullman, Spokane, and Vancouver campuses; however the programs differ slightly from campus to campus. The programs at the Vancouver campus consist of 15 months of intensive study and internships. The program on the Pullman/Spokane campuses consists of 13 months of intensive study and internships to complete teacher certification with additional time to complete the masters project. All of the MIT programs are cohort-based, forming a supportive network. The program consists of a wide range of pedagogy course work. Depending on the student's focus (elementary or secondary education), these courses may include literacy, social studies, science, math, reading, health, fitness, or fine arts methods. Students also study diversity in schools and society, educational technology, the social context of education, and research-based effective practices. When successfully completed, the MIT program results in a master's degree and teacher certification. Therefore all MIT students complete both certification and graduate research courses. All MIT students complete a research project and present the project results at the culmination of their program. The research projects are usually aimed at examining teaching and educational issues, with the focus on understanding the positive impact of education on student learning.

Post-Graduate Employment Opportunities

Elementary Education TeacherSecondary Education TeacherSchool/Curriculum Leadership PositionsAgency Services Positions

Post-Graduate Career Placements

Elementary EducationSecondary EducationDirector of Preschool Programs

Contact Information

Graduate Coordinator
Office of Graduate Studies
Washington State University
Cleveland Hall 252
Po Box 642114
Pullman, WA 99164-2114
Telephone: 509-335-9195
Fax: 509-335-2097
E-mail: gradstudies@wsu.edu

MIT Program Coordinator
Master in Teaching Elementary Program
Washington State University - Vancouver
14204 NE Salmon Creek Avenue
Vancouver, WA 98686
Telephone: 360-546-9673

Faculty

Tariq Akmal, Susan Banks, Pamela Bettis, Michael Dunn, Joy Egbert, Gisela Ernst-Slavit, Janet Frost, Leslie Hall, Michael Hayes, Leslie Huff, Henry Jackson, David Johnson, Eric Johnson, Jane Kelley, Tonda Liggett, Matthew Marino, Darcy Miller, Paulette Mills, Jo Olson, Paula Price, Thomas Salsbury, Pauline Sameshima and Dawn Shinew.

ED AD

506 Social Context of Education 2 The interpretation of social context issues including historical, legal and cultural factors as these influence policies and practice in education.

EDPSY

503 Advanced Educational Psychology 2 Theories of learning and development as applied to education.

EDRES

562 Epistemology, Inquiry, and Representation 3 Prereq doctoral standing; EdPsy 505 or c//. Epistemological assumptions and methodological strategies of research.

563 Principles of Research 3 Prereq CoPsy 501 or EdRes 562 . The centrality of literature review and the understanding of methods used in educational research; practice in designing research questions.

564 Qualitative Research 3 Prereq EdRes 563. Theoretical underpinnings of qualitative research; familiarity with published qualitative research in education; practical research skills.

565 Quantitative Research 3 Prereq EdPsy 508; EdRes/EdPsy 563. Statistical literacy in educational research; parametric and non-parametric methods.

566 Research Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Prereq doctoral student. Presentation and analysis of research; professional development in research presentation.

SP ED

520 Teaching in Inclusive Classrooms V 2-3 Graduate-level counterpart of Sp Ed 420; additional requirements. Credit not granted for both Sp Ed 420 and 520.

Teaching And Learning

T & L

501 Bilingual/ESL Education 3 May be repeated for credit; cumulative maximum 6 hours. Work with students from diverse linguistic and cultural backgrounds in educational settings.

502 Assessment for Teaching and Learning V 2-3 Instruction in sound assessment practices for preservice and inservice graduate students.

503 ESL Methods and Material for Secondary Content Teachers 2 Research-based ESL strategies and methods for pre-service and secondary content area teachers.

504 Advanced Study in Linguistics for Educators 3 Prereq admission to T & L graduate program. Use of linguistics to better understand second language learning and teaching and the physical aspects of acquiring a language.

505 ESL Methods for General Educators (K-8) 2 Research-based ESL strategies and methods for pre-service and experienced teachers.

506 Multicultural Classroom Instruction and Management 4 Instructional and management strategies for maximizing students' opportunities to learn in a multicultural setting.

507 Seminar in Literacy in Multicultural Settings I 3 Multicultural perspective to curriculum development and classroom literacy practices.

508 Seminar in Literacy in Multicultural Settings II 3 Prereq T & L 507. Multicultural perspective to curriculum development and classroom literacy practices.

509 Research in Curriculum and Assessment for Bilingual/ESL Education 3 Prereq T & L 510 or 549. Research in curriculum development for and assessment of language minority students.

510 Theoretical Foundations of Bilingual/ESL Education 3 Prereq either T & L 333, T & L 335, or T & L 413. Graduate-level counterpart of T & L 410; additional requirements. Credit not granted for both T & L 410 and 510.

512 Language and Cultural Factors in Mathematics 3 Prereq graduate standing. Research and instructional strategies related to linguistic and cultural influences on learning math.

513 Seminar in Middle School Education 3 For experienced teachers. Curriculum patterns and recent research regarding instruction and materials in the contemporary middle school.

514 Methods and Materials for Bilingual/ESL Education 3 Prereq T & L 510 or T & L 549. For pre-service and experienced teachers. Graduate-level counterpart of T & L 414; additional requirements. Credit not granted for both T & L 414 and 514.

515 The Education of Cultural and Linguistic Minority Students 3 Issues in the education of language minority students.

516 Advanced Study in Computer-Assisted Language Learning 3 Prereq T & L 510 or T & L 549. Research, theory, and practice in computer-assisted language learning.

517 Educational Technology in K-8 Schools 2 (1-2) Prereq admission to MIT program. Technology standards for teachers, technology use in schools, production techniques and instructional methods.

518 Integrating Technology into the Curriculum 3 Examination and articulation of the potential for new technologies to expand learning opportunities.

519 Instructional Media Production I 3 Instructional media development, emphasizing the theory and methods of instructional design, digital media production and evaluation.

520 Topics in Special Student Populations V 1-4 May be repeated for credit; cumulative maximum 6 hours. For K-12 teachers. Knowledge of special student populations and guidance in developing appropriate curricula.

521 Topics in Education V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and/or applications in selected areas of education.

522 Topics in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

523 Topics in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

524 Topics in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

525 Classroom Management Seminar V 2-3 Contemporary issues in management of elementary, middle school, and secondary classrooms; issues of abuse.

526 Research in Multicultural Education 3 Prereq either T & L 515 or by permission. Research and instructional practices focusing on multicultural education.

527 Seminar in Teacher Education Instruction 1 May be repeated for credit; cumulative maximum 4 hours. Teacher preparation program components and rationale, university teaching strategies, and evaluation methods.

528 Literacy within the Disciplines 3 Explores literacy research and practices that enhance the learning of various disciplines taught in K-12 settings.

529 Place-Based Education 3 Theory and practice of place-based education with an emphasis on community-based action research and curriculum planning.

530 Innovations in Reading 2 or 3 Graduate-level counterpart of T & L 431; additional requirements. Credit not granted for both T & L 431 and 530.

532 Children's Literature in the Curriculum 2 Theory and classroom applications for selecting and using literature and storytelling in content areas; reading, writing, language development, the arts.

535 Gender, Power and Education 3 Interdisciplinary focus on the relationships among gender, power and education.

536 Cultural Studies in Education 3 Historical and conceptual background of the field of cultural studies.

537 Seminar in Language, Literacy, and Culture 3 Interrelationships between schools, literacy, and student cultural background.

538 Writing Across the Curriculum 3 Writing for learning at grade levels K-12.

539 Innovations in Language Arts 3 The most recent developments in language arts instruction for pre-service and in-service teachers K-12.

540 Elementary School Social Studies 3 For candidates admitted to graduate teacher preparation and experienced teachers. Elementary structures of various social sciences; research findings related to instruction; classroom applications and materials.

541 Teacher Professional Certification: Pre-Assessment Seminar V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of ProCert application, Provisional Status/Employer Support verification (WAC 180-78A-505), and a copy of Residency Teaching Certificate. Candidates evaluate current teaching against standards to determine steps for professional growth plans which measure positive impact on student learning.

542 Teacher Professional Certification: Researching Exemplary Practices V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of T&L 541: Pre-Assessment Seminar. Teachers will apply exemplary practices, continue to assess their performance and college evidence of positive impact on student learning.

543 Teacher Professional Certification: Culminating Seminar V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of T & L 541(Pre-Assessment Seminar), Professional Growth Record initial activities approved, completed core credits, and Evidence/Artifacts gathered. Candidates will complete ProCert requirements to document positive impact on students' learning: set new goals; learn about National Board options.

544 Advanced Children's Literature 3 Trends, issues, and research in children's literature.

546 Teaching Writing in the Elementary School 3 Theory and research relevant to instructional approaches and practices for teaching writing in elementary schools.

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556 Literacy Development II 3 Prereq for candidates admitted to graduate teacher preparation. Review of current research and approaches to instruction in the development of literacy in elementary and middle grades.

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580 Multicultural Education in a Global Society 3 Graduate-level counterpart of T & L 480; additional requirements. Credit not granted for both T & L 480 and 580.

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594 Integrating Fine Arts into K-8 Curriculum 2 Integrating Fine Arts (art, music, dance, drama) into K-8 curriculum; designed for pre-service MIT.

595 Internship and Seminar 10 (1-27) Instructional practice in classroom settings, reflection on practice; professional certification.

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597 Topics in In-Service Education V 1-3 May be repeated for credit; cumulative maximum 9 hours. New developments and applications on selected in-service and staff development topics.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Teaching and Learning

Degree offered: Doctor of Philosophy (Education)

Faculty working with graduate students: 21

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: September 1

Program Description

Our mission is to advance knowledge and ethical practice in the field of education. We do so through collaboration among universities, schools, families, and local, regional and global communities in a manner that reflects the ideals of democracy, social justice, and ecological sustainability.In brief, we offer teacher certification in elementary education (bachelor of arts in education, master in teaching) and secondary education (degree from major plus certification, master in teaching), and additional endorsements. We also offer professional certification, as well as a master of education (Ed.M.)and master of arts in education (M.A.) degrees. At the doctoral level, we offer two Pullman-based degrees. Those are the doctor of education(Ed.D.) in teacher leadership and the doctor of philosophy (Ph.D.) in education with specializations in cultural studies and social thought in education, language and literacy education, and special education.The research of our faculty contributes knowledge to our undergraduate and graduate programs and to the field of education in general.Our programs rely heavily on research-based, theoretical frameworks and the close connections we maintain with classroom teachers and other practitioners. We stress active engagement, critical problem-solving, and equity/fairness for all learners.

Degree Description

The Doctor of Philosophy (Ph.D.) prepares graduates for academic positions in research and teaching.

Contact Information

Graduate Coordinator
Office of Graduate Studies
Washington State University
Cleveland Hall 252
PO Box 642114
Pullman, WA 99164-2114
Telephone: 509-335-9195
Fax: 509-335-2097
E-mail: gradstudies@wsu.edu

Faculty

Susan Banks, Pamela Bettis, Michael Dunn, Joy Egbert, Gisela Ernst-Slavit, Janet Frost, Leslie Hall, Michael Hayes, Henry Jackson, David Johnson, Eric Johnson, Jane Kelley, Tonda Liggett, Matthew Marino, Darcy Miller, Paulette Mills, Paula Price, Thomas Salsbury, Pauline Sameshima, Richard Sawyer and Dawn Shinew.

EDRES

562 Epistemology, Inquiry, and Representation 3 Prereq doctoral standing; EdPsy 505 or c//. Epistemological assumptions and methodological strategies of research.

563 Principles of Research 3 Prereq CoPsy 501 or EdRes 562 . The centrality of literature review and the understanding of methods used in educational research; practice in designing research questions.

564 Qualitative Research 3 Prereq EdRes 563. Theoretical underpinnings of qualitative research; familiarity with published qualitative research in education; practical research skills.

565 Quantitative Research 3 Prereq EdPsy 508; EdRes/EdPsy 563. Statistical literacy in educational research; parametric and non-parametric methods.

566 Research Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Prereq doctoral student. Presentation and analysis of research; professional development in research presentation.

Teaching And Learning

T & L

501 Bilingual/ESL Education 3 May be repeated for credit; cumulative maximum 6 hours. Work with students from diverse linguistic and cultural backgrounds in educational settings.

502 Assessment for Teaching and Learning V 2-3 Instruction in sound assessment practices for preservice and inservice graduate students.

503 ESL Methods and Material for Secondary Content Teachers 2 Research-based ESL strategies and methods for pre-service and secondary content area teachers.

504 Advanced Study in Linguistics for Educators 3 Prereq admission to T & L graduate program. Use of linguistics to better understand second language learning and teaching and the physical aspects of acquiring a language.

505 ESL Methods for General Educators (K-8) 2 Research-based ESL strategies and methods for pre-service and experienced teachers.

506 Multicultural Classroom Instruction and Management 4 Instructional and management strategies for maximizing students' opportunities to learn in a multicultural setting.

507 Seminar in Literacy in Multicultural Settings I 3 Multicultural perspective to curriculum development and classroom literacy practices.

508 Seminar in Literacy in Multicultural Settings II 3 Prereq T & L 507. Multicultural perspective to curriculum development and classroom literacy practices.

509 Research in Curriculum and Assessment for Bilingual/ESL Education 3 Prereq T & L 510 or 549. Research in curriculum development for and assessment of language minority students.

510 Theoretical Foundations of Bilingual/ESL Education 3 Prereq either T & L 333, T & L 335, or T & L 413. Graduate-level counterpart of T & L 410; additional requirements. Credit not granted for both T & L 410 and 510.

512 Language and Cultural Factors in Mathematics 3 Prereq graduate standing. Research and instructional strategies related to linguistic and cultural influences on learning math.

513 Seminar in Middle School Education 3 For experienced teachers. Curriculum patterns and recent research regarding instruction and materials in the contemporary middle school.

514 Methods and Materials for Bilingual/ESL Education 3 Prereq T & L 510 or T & L 549. For pre-service and experienced teachers. Graduate-level counterpart of T & L 414; additional requirements. Credit not granted for both T & L 414 and 514.

515 The Education of Cultural and Linguistic Minority Students 3 Issues in the education of language minority students.

516 Advanced Study in Computer-Assisted Language Learning 3 Prereq T & L 510 or T & L 549. Research, theory, and practice in computer-assisted language learning.

517 Educational Technology in K-8 Schools 2 (1-2) Prereq admission to MIT program. Technology standards for teachers, technology use in schools, production techniques and instructional methods.

518 Integrating Technology into the Curriculum 3 Examination and articulation of the potential for new technologies to expand learning opportunities.

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521 Topics in Education V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and/or applications in selected areas of education.

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523 Topics in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

524 Topics in Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.

525 Classroom Management Seminar V 2-3 Contemporary issues in management of elementary, middle school, and secondary classrooms; issues of abuse.

526 Research in Multicultural Education 3 Prereq either T & L 515 or by permission. Research and instructional practices focusing on multicultural education.

527 Seminar in Teacher Education Instruction 1 May be repeated for credit; cumulative maximum 4 hours. Teacher preparation program components and rationale, university teaching strategies, and evaluation methods.

528 Literacy within the Disciplines 3 Explores literacy research and practices that enhance the learning of various disciplines taught in K-12 settings.

529 Place-Based Education 3 Theory and practice of place-based education with an emphasis on community-based action research and curriculum planning.

530 Innovations in Reading 2 or 3 Graduate-level counterpart of T & L 431; additional requirements. Credit not granted for both T & L 431 and 530.

532 Children's Literature in the Curriculum 2 Theory and classroom applications for selecting and using literature and storytelling in content areas; reading, writing, language development, the arts.

535 Gender, Power and Education 3 Interdisciplinary focus on the relationships among gender, power and education.

536 Cultural Studies in Education 3 Historical and conceptual background of the field of cultural studies.

537 Seminar in Language, Literacy, and Culture 3 Interrelationships between schools, literacy, and student cultural background.

538 Writing Across the Curriculum 3 Writing for learning at grade levels K-12.

539 Innovations in Language Arts 3 The most recent developments in language arts instruction for pre-service and in-service teachers K-12.

540 Elementary School Social Studies 3 For candidates admitted to graduate teacher preparation and experienced teachers. Elementary structures of various social sciences; research findings related to instruction; classroom applications and materials.

541 Teacher Professional Certification: Pre-Assessment Seminar V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of ProCert application, Provisional Status/Employer Support verification (WAC 180-78A-505), and a copy of Residency Teaching Certificate. Candidates evaluate current teaching against standards to determine steps for professional growth plans which measure positive impact on student learning.

542 Teacher Professional Certification: Researching Exemplary Practices V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of T&L 541: Pre-Assessment Seminar. Teachers will apply exemplary practices, continue to assess their performance and college evidence of positive impact on student learning.

543 Teacher Professional Certification: Culminating Seminar V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq completion of T & L 541(Pre-Assessment Seminar), Professional Growth Record initial activities approved, completed core credits, and Evidence/Artifacts gathered. Candidates will complete ProCert requirements to document positive impact on students' learning: set new goals; learn about National Board options.

544 Advanced Children's Literature 3 Trends, issues, and research in children's literature.

546 Teaching Writing in the Elementary School 3 Theory and research relevant to instructional approaches and practices for teaching writing in elementary schools.

547 Teaching Folk Literature to Children and Adolescents 3 Folk literature as a genre in child and adolescent literature; curriculum applications; reading, language development, social studies, creative expression.

548 Teaching Adolescent Literature 3 Evaluating, selecting, and using literature for middle school and teenage students.

549 Communicating in a Multilingual Society 3 Prereq T & L 333, T & L 335, T & L 413 or graduate standing. Study of language in social and educational context and its relation to cultural and linguistic diversity.

550 Second Language Learning and Literacy 3 Prereq admission to doctoral program. Research on second language teaching and learning in literacy education with a focus on English language learners in US schools.

551 Psychology of Reading V 2-3 Psychological, perceptual, motivational, developmental and physiological aspects of reading.

552 Literacy Development I 3 For candidates admitted to graduate teacher preparation. Review of current research and approaches to instruction in the development of literacy in elementary and middle grades.

553 Assessment and Instruction for Reading: K-8 4 (3-3) Prereq T & L 307; T & L 321; T & L 322; T & L 551. Evaluation techniques and instructional practices for impacting the reading achievement of K-8 students.

554 Sociolinguistics 3 Prereq doctoral student. Interaction between language use and sociopolitical and cultural contexts; cultural and linguistic delivery and educational opportunity.

555 Seminar in Literacy Development 3 May be repeated for credit; cumulative maximum 6 hours. Current and historical research in reading/language arts, infancy through college and adult years; papers presented by faculty, invited speakers, and students.

556 Literacy Development II 3 Prereq for candidates admitted to graduate teacher preparation. Review of current research and approaches to instruction in the development of literacy in elementary and middle grades.

557 Research in Reading 3 Prereq EdPsy 505. Exploration of qualitative and quantitative reading research covering topics of current and historical importance.

558 Improving Comprehension through Literature 3 Key theoretical concepts and their implications for improved comprehension instruction, using children's literature.

559 Readings in Cultural Studies and Social Thought in Education 1 May be repeated for credit; cumulative maximum 3 hours. Current scholarship in the field of cultural studies in education and practices of schools.

560 Research in Teaching 3 May be repeated for credit; cumulative maximum 6 hours. Recent developments in research on teaching; both quantitative and qualitative research methodologies emphasized.

561 Elementary School Mathematics 3 Research on curriculum and instruction issues in elementary school mathematics.

564 Elementary School Mathematics Methods 3 For candidates admitted to graduate teacher preparation. Introduction to research, theory, and methods of teaching K-8 mathematics; emphasis on integrating theory and practice.

565 Introduction to Scholarly Inquiry 1 Prereq graduate standing. Introduction to the Ed.M program including the scholarship and research requirements and the role of students and action research.

566 Democratic Education 3 Prereq graduate standing. Rationale and skill to assist teachers in making classrooms more democratic.

567 Social Foundations of Literacy 3 Prereq admission to doctoral program. Social, cultural and political factors which influence the acquisition and use of literacy.

568 Psychological Foundations and Assessment of Literacy 3 Prereq admission to doctoral program. Historical look that blends the assessment of literacy and its psychological components.

569 Critical Analysis of Children's and Young Adult Literature 3 Prereq doctoral student. Multicultural analysis of children's and adolescent literature and its pedagogical and sociopolitical implications and possibilities.

570 Theory and Research in Electronic Literacies 3 . Ideas of literacy and effects of technology on literacy and policy, particularly those issues addressing diverse learners.

571 Elementary School Science 3 Prereq for candidates admitted to graduate teacher preparation. Theories and research underlying science programs with classroom implications.

572 Elementary School Science Methods 3 For candidates admitted to graduate teacher preparation. Theoretical base to design and implement appropriate standards-based elementary science instruction.

574 Science for All: An Individual and Multicultural Perspective 3 Prereq for candidates admitted to graduate teacher preparation. Implications of cultural and individual diversity for understanding western scientific and mathematical thought; an activity-based, educational perspective.

575 Globalization and Identity in Education 3 Issues relating to the complexities of globalization and identity in education.

576 Youth Cultures in Education 3 Analysis of how youth cultures operate in society and how they are practiced in schools.

577 Curriculum Theory 3 Curriculum theory as the interdisciplinary study of educational experience.

580 Multicultural Education in a Global Society 3 Graduate-level counterpart of T & L 480; additional requirements. Credit not granted for both T & L 480 and 580.

583 Problem Solving in Elementary and Middle Level Education 3 For candidates admitted to graduate teacher preparation. Integration of knowledge and skills to address complex cases in teaching and learning.

587 Environment, Culture and Education 3 Prereq graduate standing. Role of education in the social, ecological, and political conflicts between culture and environment.

588 Action Research: Teachers as Research 3 Theoretical concepts, research, issues, models, and strategies for implementation of action research.

589 Race, Identity and Representation in Education 3 Interdisciplinary research in race, identity and representations in education.

590 Internship V 2 (0-2) to 6 (0-18) May be repeated for credit; cumulative maximum 12 hours. By interview only. Opportunities in professional positions.

592 Social Theory in Education 3 Prereq doctoral student. Social theory and how it applies to intellectual work in education.

593 Pre-internship and Seminar 2 (1-3) Instructional practice in diverse classroom settings and reflection on that practice.

594 Integrating Fine Arts into K-8 Curriculum 2 Integrating Fine Arts (art, music, dance, drama) into K-8 curriculum; designed for pre-service MIT.

595 Internship and Seminar 10 (1-27) Instructional practice in classroom settings, reflection on practice; professional certification.

596 Topics in In-Service Education V 1-3 May be repeated for credit; cumulative maximum 12 hours. Prereq graduate standing or permission of instructor. Advanced study of research, practice, and contemporary issues in education.

597 Topics in In-Service Education V 1-3 May be repeated for credit; cumulative maximum 9 hours. New developments and applications on selected in-service and staff development topics.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Veterinary Science - Combined Anatomic Pathology Residency

Degree offered: Doctor of Philosophy

Faculty working with graduate students: 23

Graduate students: 7

Graduate students receiving assistantships or scholarships: 100%

Tests required: IELTS, TOEFL, TOEFLI

Deadline: Fall: Rolling Deadline
Spring: Rolling Deadline

Program Description

The College of Veterinary Medicine offers degrees leading to the MS and PhD (in addition to the professional DVM degree). The college is composed of two schools and three departments: the Paul G. Allen School for Global Animal Health, the School of Molecular Biosciences, the Department of Veterinary Clinical Sciences, the Department of Veterinary and Comparative Anatomy, Pharmacology and Physiology, and the Department of Veterinary Microbiology and Pathology. Each unit offers specialization in fields such as anatomy, cell biology, genetics, epidemiology, immunology, microbiology, and infectious diseases, pharmacology, physiology, reproductive biology, and structural biology. The School of Molecular Biosciences also offers a Professional Masters in Science program. Post-DVM clinical residents may specialize in areas such as anatomic and clinical pathology, anesthesiology, cardiology, clinical microbiology, internal medicine, neurology, ophthalmology, radiology, surgery, and theriogenology. For more information, please see the specific individual programs.

Degree Description

The program's research and training programs are focused in the immunology, epidemiology and host-pathogen interactions at the molecular level of bacterial, parasitic, and viral infections of animals and humans. The academic research environment is enriched by integration of the Department of Veterinary Microbiology and Pathology, the School of Molecular Biosciences, the Paul G. Allen School for Global Animal Health (http://globalhealth.wsu.edu/), the Washington State University Animal Health Research Center and the USDA-ARS Animal Disease Research Unit. Dissertation research is carried out under the direction of a highly collaborative research faculty internationally recognized for infectious disease research and who are experienced in mentoring trainees within state-of-the-art laboratories funded by federal agencies including NIH, NSF, USAID, and USDA, non-profit research foundations such as The Wellcome Trust and the Bill and Melinda Gates Foundation, and other federal, state, regional, and private institutions and organizations. The residency training occurs within the Washington Animal Disease Diagnostic Laboratory (WADDL), a full service veterinary diagnostic laboratory staffed by faculty of the Departments of Veterinary Microbiology and Pathology and Veterinary Clinical Sciences. WADDL has 3 primary facilities, a primary full service laboratory in Pullman, an Aquatic Health laboratory in Pullman

and an Avian Health and Food Safety Laboratory branch in Puyallup. The laboratories are accredited by the American Association of Veterinary Laboratory Diagnosticians (AAVLD), WADDL is one of 12 founding members of the National Animal Health Laboratory Network , and one of the 9 veterinary diagnostic laboratories that serve as a reference lab in the Laboratory Response Network for Bioterrorism. This ensures that residents develop a strong background in all aspects of laboratory medicine, including detection and diagnosis of emerging and zoonotic pathogens. The faculty includes 12 ACVP- and ACLAM- certified pathologists with training focused on close interaction among faculty and trainees. The high level surgical biopsy and necropsy case loads provide direct experiential learning and are supported by specialized pathology seminars.Overview of the Graduate Program: Training is tailored to the individual's background and career goals, with the proviso that a strong basic sciences foundation is indispensable in preparation for disease research. Core knowledge is advanced through regularly scheduled research seminars, special research seminar series, and through directed readings with the Graduate faculty. Mentored laboratory research is the most critical part of the training and the strength of our program. This is the primary mechanism by which the philosophy of research is imparted to new scientists. Together the major professor and graduate student trainee develop a directed course of research. Throughout the training period, all graduate students attend weekly research seminars where faculty and trainees present recent results. The goal of trainee participation in these seminars is exposure to critical analysis of data, experimental design and discussion of research significance. Trainees are expected to conduct original research leading to a significant contribution to knowledge in the trainee's area of emphasis and culminating in publication in leading international scientific journals. This publication is required for and constitutes the PhD dissertation. The final PhD examination is preceded by a public presentation of the research, attended by the faculty, graduate students, and post-doctoral fellows, followed by an oral examination.

Contact Information

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MBIOS

501 **Cell Biology** 3 Prereq MBioS 301, 303, or graduate standing; c// with MBioS 529 highly recommended. Graduate-level counterpart of MBioS 401; additional requirements. Credit not granted for both MBioS 401 and 501.

503 **Molecular Biology I** 3 Prereq MBioS 301, 303, or graduate standing. DNA replication and recombination in prokaryotes and eukaroytes; recombinant DNA methods and host/vector systems; genome analysis; transgenic organisms.

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513 **General Biochemistry I** 3 Prereq MBioS 303, graduate standing. Graduate-level counterpart of MBioS 413; additional requirements. Credit not granted for both MBioS 413 and 513.

514 **General Biochemistry** 3 Prereq MBioS 413, or graduate standing. Graduate-level counterpart of MBioS 414; additional requirements. Credit not granted for both 414 and 514.

540 **Immunology** 3 Prereq MBioS 305; organic chemistry or graduate standing; c// with MBioS 548 highly recommended. Graduate-level counterpart of MBioS 440; additional requirements. Credit not granted for both MBioS 440 and 540.

STAT

512 **Statistical Methods in Research II** 3 (2-2) Prereq Stat 412 or equivalent. Analysis and interpretation of designed experiments: CRD, RCBD, spit-plot and repeated measures, multiple comparisons, multiple regression modeling, validation of assumptions.

V MIC

592 **Advances in Immunobiology** 1 May be repeated for credit.

V PA

542 **Advanced Diagnostic Pathology** V 1 (0-3) to 4 (0-12) May be repeated for credit; cumulative maximum 8 hours. Prereq V M 546P. Necropsy laboratory for techniques and skills in performing and interpreting necropsy material.

544 **Immunopathology** 4 Prereq V M 545P, V Mic 531. The role of immune processes in the pathogenesis of disease.

545 **Mechanisms of Disease** 4 Prereq MBioS 440 or V M 534P, 545P. Biochemical and immunological mechanisms involved in disease processes from the comparative standpoint.

548 **Introduction to Research** 1 Introduction to research.

555 **Research in Progress Seminar** 1 May be repeated for credit; cumulative maximum 8 hours. Presentation of on-going student research project results.

592 **Anatomic Pathology Seminar** 1 May be repeated for credit. Histopathologic description and diagnosis.

800 **Doctoral Research, Dissertation, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit. For PhD in veterinary science only.

Veterinary Science - Combined Anatomic Pathology Residency

Degree offered: Master of Science in Veterinary Science

Faculty working with graduate students: 23

Tests required: IELTS, TOEFL, TOEFLI

Deadline: Fall: Rolling Deadline
Spring: Rolling Deadline

Program Description

The College of Veterinary Medicine offers degrees leading to the MS and PhD (in addition to the professional DVM degree). The college is composed of two schools and three departments: the Paul G. Allen School for Global Animal Health, the School of Molecular Biosciences, the Department of Veterinary Clinical Sciences, the Department of Veterinary and Comparative Anatomy, Pharmacology and Physiology, and the Department of Vet-

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535 **Advanced Readings in Veterinary Microbiology** 1 (0-3) May be repeated for credit. Prereq fourth year in veterinary medicine or graduate student in Vet S. Supervised reading program which peruses publications of intermediate technical difficulty and advanced textbooks.

572 **Advanced Topics in Microbiology, Parasitology, or Immunology** V 1-3 May be repeated for credit; cumulative maximum 4 hours. Advanced topics in microbiology, parasitology, or immunology presented in short-course, or workshop format.

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700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit. For MS in veterinary science only.

Veterinary Science - Combined Clinical Microbiology Residency

Degree offered: Doctor of Philosophy

Faculty working with graduate students: 23

Graduate students: 3

Graduate students receiving assistantships or scholarships: 100%

Tests required: IELTS, TOEFL, TOEFLI

Deadline: Fall: Rolling Deadline
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Program Description

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Training and Professional Development Opportunities

The training incoprpoates full residency training in an AAVLD accedited laboratory.

Post-Graduate Employment Opportunities

Academic, state and national laboratories, biotechnology companies.

Post-Graduate Career Placements

Direector of Laboratory, Professor, Chief Scientist

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591 Seminar in Diagnostic Microbiology 1 May be repeated for credit; cumulative maximum 8 hours. Seminar in diagnostic veterinary microbiology.

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Veterinary Science - Combined Clinical Microbiology Residency

Degree offered: Master of Science in Veterinary Science

Faculty working with graduate students: 23

Tests required: IELTS, TOEFL, TOEFLI

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Faculty

Timothy Baszler, Thomas Besser, Kelly Brayton, Wendy Brown, Douglas Call, William Davis, William Foreyt, Gary Haldorson, Stephen Hines, Douglas Jasmer, Donald Knowles, Kevin Lahmers, Audrey Lau, Charles Leathers, Terry McElwain, Robert Mealey, Guy Palmer, Kathleen Potter, David Prieur, Devendra Shah, Kevin Snekvik, Subramaniam Srikumaran and James Stanton.

MBIOS

501 **Cell Biology** 3 Prereq MBioS 301, 303, or graduate standing; c// with MBioS 529 highly recommended. Graduate-level counterpart of MBioS 401; additional requirements. Credit not granted for both MBioS 401 and 501.

503 **Molecular Biology I** 3 Prereq MBioS 301, 303, or graduate standing. DNA replication and recombination in prokaryotes and eukaroytes; recombinant DNA methods and host/vector systems; genome analysis; transgenic organisms.

504 **Molecular Biology II** 3 Prereq MBioS 301, 303, or graduate standing. Gene expression and regulation in prokaryotes and eukaryotes, including transcription, RNA processing, and translation; chromatin structure; DNA repair.

513 **General Biochemistry I** 3 Prereq MBioS 303, graduate standing. Graduate-level counterpart of MBioS 413; additional requirements. Credit not granted for both MBioS 413 and 513.

514 **General Biochemistry** 3 Prereq MBioS 413, or graduate standing. Graduate-level counterpart of MBioS 414; additional requirements. Credit not granted for both 414 and 514.

540 **Immunology** 3 Prereq MBioS 305; organic chemistry or graduate standing; c// with MBioS 548 highly recommended. Graduate-level counterpart of MBioS 440; additional requirements. Credit not granted for both MBioS 440 and 540.

STAT

512 **Statistical Methods in Research II** 3 (2-2) Prereq Stat 412 or equivalent. Analysis and interpretation of designed experiments: CRD, RCBD, spit-plot and repeated measures, multiple comparisons, multiple regression modeling, validation of assumptions.

V MIC

535 **Advanced Readings in Veterinary Microbiology** 1 (0-3) May be repeated for credit. Prereq fourth year in veterinary medicine or graduate student in Vet S. Supervised reading program which peruses publications of intermediate technical difficulty and advanced textbooks.

541 **Advanced Diagnostic Microbiology** 1 (0-3) May be repeated for credit; cumulative maximum 8 hours. Prereq V M 534P, 535P, 536P. Microbiology laboratory for performing and interpreting virologic, serologic, and related tests for the diagnosis of animal diseases.

572 **Advanced Topics in Microbiology, Parasitology, or Immunology** V 1-3 May be repeated for credit; cumulative maximum 4 hours. Advanced topics in microbiology, parasitology, or immunology presented in short-course, or workshop format.

591 **Seminar in Diagnostic Microbiology** 1 May be repeated for credit; cumulative maximum 8 hours. Seminar in diagnostic veterinary microbiology.

592 **Advances in Immunobiology** 1 May be repeated for credit.

700 **Master's Research, Thesis, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit. For MS in veterinary science only.

V PA

544 **Immunopathology** 4 Prereq V M 545P, V Mic 531. The role of immune processes in the pathogenesis of disease.

545 **Mechanisms of Disease** 4 Prereq MBioS 440 or V M 534P, 545P. Biochemical and immunological mechanisms involved in disease processes from the comparative standpoint.

548 **Introduction to Research** 1 Introduction to research.

555 **Research in Progress Seminar** 1 May be repeated for credit; cumulative maximum 8 hours. Presentation of on-going student research project results.

Veterinary Science - Immunology and Infectious Diseases

Degree offered: Doctor of Philosophy

Faculty working with graduate students: 23

Graduate students: 31

Graduate students receiving assistantships or scholarships: 100%

Tests required: IELTS, TOEFL, TOEFLI

Deadline: Fall: Rolling Deadline
Spring: Rolling Deadline

Program Description

The College of Veterinary Medicine offers degrees leading to the MS and PhD (in addition to the professional DVM degree). The college is composed of two schools and three departments: the Paul G. Allen School for Global Animal Health, the School of Molecular Biosciences, the Department of Veterinary Clinical Sciences, the Department of Veterinary and Com-

parative Anatomy, Pharmacology and Physiology, and the Department of Veterinary Microbiology and Pathology. Each unit offers specialization in fields such as anatomy, cell biology, genetics, epidemiology, immunology, microbiology, and infectious diseases, pharmacology, physiology, reproductive biology, and structural biology. The School of Molecular Biosciences also offers a Professional Masters in Science program. Post-DVM clinical residents may specialize in areas such as anatomic and clinical pathology, anesthesiology, cardiology, clinical microbiology, internal medicine, neurology, ophthalmology, radiology, surgery, and theriogenology. For more information, please see the specific individual programs.

Degree Description

We offer outstanding doctoral education in the immunology, epidemiology and host-pathogen interactions of bacterial, parasitic, and viral infections of animals and humans. The academic research environment is enriched by integration of the Department of Veterinary Microbiology and Pathology, the School of Molecular Biosciences, the Paul G. Allen School for Global Animal Health (http://globalhealth.wsu.edu/), the Washington State University Animal Health Research Center and the USDA-ARS Animal Disease Research Unit. Dissertation research is carried out under the direction of a highly collaborative research faculty internationally recognized for infectious disease research and who are experienced in mentoring trainees within state-of-the-art laboratories funded by federal agencies including NIH, NSF, USAID, and USDA, non-profit research foundations such as The Wellcome Trust and the Bill and Melinda Gates Foundation, and other federal, state, regional, and private institutions and organizations. Overview of the Graduate Program: Training is tailored to the individual's background and career goals, with the proviso that a strong basic sciences foundation is indispensable in preparation for disease research. Core knowledge is advanced through regularly scheduled research seminars, special research seminar series, and through directed readings with the Graduate faculty. Mentored laboratory research is the most critical part of the training and the strength of our program. This is the primary mechanism by which the philosophy of research is imparted to new scientists. Together the major professor and graduate student trainee develop a directed course of research. Throughout the training period, all graduate students attend weekly research seminars where faculty and trainees present recent results. The goal of trainee participation in these seminars is exposure to critical analysis of data, experimental design and discussion of research significance. Trainees are expected to conduct original research leading to a significant contribution to knowledge in the trainee's area of emphasis and culminating in publication in leading international scientific journals. This publication is required for and constitutes the PhD dissertation. The final PhD examination is preceded by a public presentation of the research, attended by the faculty, graduate students, and post-doctoral fellows, followed by an oral examination.

Training and Professional Development Opportunities

Collaborative research in laboratories and research sites associated with the paul G. Allen School for Global Animal Health

Post-Graduate Employment Opportunities

Academia, national and international laboratories, biotechnology companies.

Post-Graduate Career Placements

Professor, Director of Laboratory, Chief Scientist

Contact Information

Sue Zumwalt
Administrative Manager
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402 Bustad Hall
Pullman, WA 99164-7040
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Faculty

Timothy Baszler, Thomas Besser, Kelly Brayton, Wendy Brown, Douglas Call, William Davis, William Foreyt, Gary Haldorson, Stephen Hines, Douglas Jasmer, Donald Knowles, Kevin Lahmers, Audrey Lau, Charles Leathers, Terry McElwain, Robert Mealey, Guy Palmer, Kathleen Potter, David Prieur, Devendra Shah, Kevin Snekvik, Subramaniam Srikumaran and James Stanton.

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540 **Immunology** 3 Prereq MBioS 305; organic chemistry or graduate standing; c// with MBioS 548 highly recommended. Graduate-level counterpart of MBioS 440; additional requirements. Credit not granted for both MBioS 440 and 540.

STAT

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V MIC

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572 **Advanced Topics in Microbiology, Parasitology, or Immunology** V 1-3 May be repeated for credit; cumulative maximum 4 hours. Advanced topics in microbiology, parasitology, or immunology presented in short-course, or workshop format.

592 **Advances in Immunobiology** 1 May be repeated for credit.

800 **Doctoral Research, Dissertation, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit. For PhD in veterinary science only.

V PA

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548 Introduction to Research 1 Introduction to research.

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Veterinary Science - Immunology and Infectious Diseases

Degree offered: Master of Science in Veterinary Science

Faculty working with graduate students: 23

Graduate students: 7

Graduate students receiving assistantships or scholarships: 100%

Tests required: IELTS, TOEFL, TOEFLI

Deadline: Fall: Rolling Deadline
Spring: Rolling Deadline

Program Description

The College of Veterinary Medicine offers degrees leading to the MS and PhD (in addition to the professional DVM degree). The college is composed of two schools and three departments: the Paul G. Allen School for Global Animal Health, the School of Molecular Biosciences, the Department of Veterinary Clinical Sciences, the Department of Veterinary and Comparative Anatomy, Pharmacology and Physiology, and the Department of Veterinary Microbiology and Pathology. Each unit offers specialization in fields such as anatomy, cell biology, genetics, epidemiology, immunology, microbiology, and infectious diseases, pharmacology, physiology, reproductive biology, and structural biology. The School of Molecular Biosciences also offers a Professional Masters in Science program. Post-DVM clinical residents may specialize in areas such as anatomic and clinical pathology, anesthesiology, cardiology, clinical microbiology, internal medicine, neurology, ophthalmology, radiology, surgery, and theriogenology. For more information, please see the specific individual programs.

Degree Description

We offer outstanding doctoral education in the immunology, epidemiology and host-pathogen interactions of bacterial, parasitic, and viral infections of animals and humans. The academic research environment is enriched by integration of the Department of Veterinary Microbiology and Pathology, the School of Molecular Biosciences, the Paul G. Allen School for Global Animal Health (http://globalhealth.wsu.edu/), the Washington State University Animal Health Research Center and the USDA-ARS Animal Disease Research Unit. Dissertation research is carried out under the direction of a highly collaborative research faculty internationally recognized for infectious disease research and who are experienced in mentoring trainees within state-of-the-art laboratories funded by federal agencies including NIH, NSF, USAID, and USDA, non-profit research foundations such as The Wellcome Trust and the Bill and Melinda Gates Foundation, and other federal, state, regional, and private institutions and organizations. Overview of the Graduate Program: Training is tailored to the individual's background and career goals, with the proviso that a strong basic sciences foundation is indispensable in preparation for disease research. Core knowledge is advanced through regularly scheduled research seminars, special research seminar series, and through directed readings with the Graduate faculty. Mentored laboratory research is the most critical part of the training and the strength of our program. This is the primary mechanism by which the philosophy of research is imparted to new scientists. Together the major professor and graduate student trainee develop a directed course of research. Throughout the training period, all graduate students attend weekly research seminars where faculty and trainees present recent results. The goal of trainee participation in these seminars is exposure to critical analysis of data, experimental design and discussion of research significance. Trainees are expected to conduct original research leading to a significant contribution to knowledge in the trainee's area of emphasis and culminating in publication in leading international scientific journals. This publication is required for and constitutes the MS thesis. The final MS examination is preceded by a public presentation of the research, attended by the faculty, graduate students, and post-doctoral fellows, followed by an oral examination.

Training and Professional Development Opportunities

Collaborative research in national and international laboratories.

Post-Graduate Employment Opportunities

Academic research, state and national laboratories, biotechnology companies.

Post-Graduate Career Placements

Research technologist, Senior Scientist

Contact Information

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513 General Biochemistry I 3 Prereq MBioS 303, graduate standing. Graduate-level counterpart of MBioS 413; additional requirements. Credit not granted for both MBioS 413 and 513.

514 General Biochemistry 3 Prereq MBioS 413, or graduate standing. Graduate-level counterpart of MBioS 414; additional requirements. Credit not granted for both 414 and 514.

540 Immunology 3 Prereq MBioS 305; organic chemistry or graduate standing; c// with MBioS 548 highly recommended. Graduate-level counterpart of MBioS 440; additional requirements. Credit not granted for both MBioS 440 and 540.

STAT

512 Statistical Methods in Research II 3 (2-2) Prereq Stat 412 or equivalent. Analysis and interpretation of designed experiments: CRD, RCBD, spit-plot and repeated measures, multiple comparisons, multiple regression modeling, validation of assumptions.

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592 Advances in Immunobiology 1 May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit. For MS in veterinary science only.

V PA

544 Immunopathology 4 Prereq V M 545P, V Mic 531. The role of immune processes in the pathogenesis of disease.

545 Mechanisms of Disease 4 Prereq MBioS 440 or V M 534P, 545P. Biochemical and immunological mechanisms involved in disease processes from the comparative standpoint.

548 Introduction to Research 1 Introduction to research.

555 Research in Progress Seminar 1 May be repeated for credit; cumulative maximum 8 hours. Presentation of on-going student research project results.

Veterinary Science - Veterinary and Comparative Anatomy, Pharmacology & Physiology

Degree offered: Doctor of Philosophy

Faculty working with graduate students: 23

Graduate students: 4

Graduate students receiving assistantships or scholarships: 100%

Tests required: GRE (Combined), TOEFL

Deadline: Fall: December 31
Spring: December 31

Requirements

Transcripts, 3 letters of reference, resume or curriculum vita, personal statement describing why the student is interested in studying Neuroscience and a writing sample. Application review begins 12/31 each year.

Program Description

The College of Veterinary Medicine offers degrees leading to the MS and PhD (in addition to the professional DVM degree). The college is composed of two schools and three departments: the Paul G. Allen School for Global Animal Health, the School of Molecular Biosciences, the Department of Veterinary Clinical Sciences, the Department of Veterinary and Comparative Anatomy, Pharmacology and Physiology, and the Department of Veterinary Microbiology and Pathology. Each unit offers specialization in fields such as anatomy, cell biology, genetics, epidemiology, immunology, microbiology, and infectious diseases, pharmacology, physiology, reproductive biology, and structural biology. The School of Molecular Biosciences also offers a Professional Masters in Science program. Post-DVM clinical residents may specialize in areas such as anatomic and clinical pathology, anesthesiology, cardiology, clinical microbiology, internal medicine, neurology, ophthalmology, radiology, surgery, and theriogenology. For more information, please see the specific individual programs.

Degree Description

The Department of Veterinary and Comparative Anatomy, Pharmacology and Physiology offers a course of study leading to the degrees of Master of Science and Doctor of Philosophy in Veterinary Science. These degrees are designed to provide broad training in specific aspects of veterinary science and related disciplines to prepare students for careers in teaching, research, and service. The curriculum is research intensive emphasizing the acquisition of theoretical understanding of a field and or research skills in preparation for a career in teaching and research. The veterinary science degree allows for maximum flexibility within the curriculum. Students will design their degree plan in consultation with a faculty mentor, emphasizing the specialty fields of anatomy, pharmacology or physiology. It is required that a student contact and arrange for a faculty mentor prior to admission to the program.The objectives for the Ph.D. level training are to prepare the candidate for a career as an independent investigator (i.e., can compete for extramural private and federal funds as the principal investigator).

Training and Professional Development Opportunities

n/a

Post-Graduate Employment Opportunities

Post Doctoral Fellow at Higher Education Institutions, Industry (e.g. pharmaceutical, biotech)

Post-Graduate Career Placements

Post Doctoral Fellow at Higher Education Institutions, faculty at Higher Education Institutions, Industry (e.g. pharmaceutical, biotech)

Contact Information

Becky Morton
Manager
Dept of VCAPP
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Faculty

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MBIOS

303 Introductory Biochemistry 4 Prereq Chem 106; Chem 345. Modern biochemistry for undergraduates in the biological sciences.

503 Molecular Biology I 3 Prereq MBioS 301, 303, or graduate standing. DNA replication and recombination in prokaryotes and eukaroytes; recombinant DNA methods and host/vector systems; genome analysis; transgenic organisms.

NEURO

509 Affective Neuroscience 3 Prereq graduate standing. Graduate-level counterpart of Neuro 409; additional requirements. Credit not granted for both Neuro 409 and 509.

520 Fundamentals of Neuroscience 4 (3-3) Prereq permission of instructor or graduate standing. Functional aspects of the brain from cell membrane to higher integrative processes.

521 Introduction to Veterinary Neurology 3 (2-3) Prereq V M 510P. Same as V M 521P.

526 Domestic and Exotic Animal Behavior 2 (1-3) Prereq by interview only. Same as V M 526P.

529 Integrative Neuroscience 3 Prereq graduate standing; biochemistry course. Basic biochemical processes in the nervous system and their significance for normal and abnormal function.

531 Neuroscience Laboratory Rotation 1 (0-3) May be repeated for credit; cumulative maximum 2 hours. Prereq graduate standing. Fourteen-week rotation through each of two research laboratories; learning procedures and techniques in neuroscience.

540 Special Topics in Integrative Neuroscience 3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing. Concepts and controversies in neuroscience involving integrative properties of cell systems. May be repeated for credit; cumulative maximum 6 hours.

541 Special Topics in Cellular and Molecular Neuroscience 3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing. Concepts and controversies in neuroscience that involve nerve cell function and regulation. May be repeated; cumulative maximum 6 hours.

542 Special Topics in Disciplinary Neuroscience 3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing. Concepts and controversies in neuroscience that revolve around traditional approaches to nervous system study. May be repeated; cumulative maximum 6 hours.

543 Special Topics in Behavioral/Clinical Neuroscience 3 May be repeated for credit; cumulative maximum 6 hours. Concepts and controversies in neuroscience that involve normal and pathological aspects of behavior.

592 Research Writing and Seminar 3 May be repeated for credit; cumulative maximum 6 hours. Written and oral communication of scientific information; formal instruction while preparing research proposals and departmental seminar.

PSYCH

511 Analysis of Variance and Experimental Design 4 Prereq Psych 311 or statistics course. Parametric, nonparametric, repeated-measures, and multivariate ANOVA; planned comparisons; confidence intervals and power analysis; experimental design and variants.

512 Correlation, Regression, and Quasi-Experimental Design 3 Prereq Psych 511. Simple and multiple correlation and regression; time-series analysis; factor analysis; field research and quasi-experimental design.

STAT

412 Statistical Methods in Research I 3 Prereq Stat 212, Math 140, 171, 202, or graduate standing. Intermediate statistical methods, design and analysis of research studies: completely randomized and randomized block designs, multiple regression, categorical data analysis.

443 Applied Probability 3 Prereq Math 172; 220. Axioms of probability theory; random variables; expectation; generating function; law of large numbers; central limit theorem; Markov chains.

V PH

308 Functional Anatomy of Domestic Animals 4 (3-3) Prereq Biol 107; junior standing. Macroscopic functional morphology of domestic animals.

499 Special Problems V 1 (0-3) to 4 (0-12) May be repeated for credit.

505 Design and Analysis of Biomedical Experiments 4 Prereq Math 107; Stat 212 or higher. Design of experiments with application to clinical and basic biomedical research; choosing, applying, and evaluating appropriate data analysis methods.

555 General and Cellular Physiology 4 (3-3) Prereq MBioS 303 or c//; MBioS 513. Physiochemical mechanisms of cellular function.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit. For PhD in veterinary science only.

Veterinary Science - Veterinary and Comparative Anatomy, Pharmacology & Physiology

Degree offered: Master of Science in Veterinary Science

Faculty working with graduate students: 23

Program offered: Pullman, Spokane, Vancouver

Tests required: GRE (Combined), TOEFL

Deadline: Fall: December 31
Spring: December 31

Requirements

Transcripts, 3 letters of reference, resume or curriculum vita, personal statement describing why the student is interested in studying Neuroscience and a writing sample. Application review begins 12/31 each year.

Program Description

The College of Veterinary Medicine offers degrees leading to the MS and PhD (in addition to the professional DVM degree). The college is composed of two schools and three departments: the Paul G. Allen School for Global Animal Health, the School of Molecular Biosciences, the Department of Veterinary Clinical Sciences, the Department of Veterinary and Comparative Anatomy, Pharmacology and Physiology, and the Department of Veterinary Microbiology and Pathology. Each unit offers specialization in fields such as anatomy, cell biology, genetics, epidemiology, immunology, microbiology, and infectious diseases, pharmacology, physiology, reproductive biology, and structural biology. The School of Molecular Biosciences also offers a Professional Masters in Science program. Post-DVM clinical residents may specialize in areas such as anatomic and clinical pathology, anesthesiology, cardiology, clinical microbiology, internal medicine, neurology, ophthalmology, radiology, surgery, and theriogenology. For more information, please see the specific individual programs.

Training and Professional Development Opportunities

n/a

Post-Graduate Employment Opportunities

Graduate education at the PhD level, Industry.

Post-Graduate Career Placements

Graduate education at the PhD level, Industry.

Contact Information

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MBIOS

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503 Molecular Biology I 3 Prereq MBioS 301, 303, or graduate standing. DNA replication and recombination in prokaryotes and eukaroytes; recombinant DNA methods and host/vector systems; genome analysis; transgenic organisms.

NEURO

403 Cellular Neurobiology 3 Prereq Neuro 301; MBioS 303; certified Neuro major or minor or instructor's permission. Cellular and molecular interactions occurring within the nervous system.

404 Neuroanatomy 4 (3-3) Prereq Neuro 301, or by interview only. Fundamental principles of the organization and plans of circuitry of the nervous system.

509 Affective Neuroscience 3 Prereq graduate standing. Graduate-level counterpart of Neuro 409; additional requirements. Credit not granted for both Neuro 409 and 509.

520 Fundamentals of Neuroscience 4 (3-3) Prereq permission of instructor or graduate standing. Functional aspects of the brain from cell membrane to higher integrative processes.

521 Introduction to Veterinary Neurology 3 (2-3) Prereq V M 510P. Same as V M 521P.

526 Domestic and Exotic Animal Behavior 2 (1-3) Prereq by interview only. Same as V M 526P.

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542 Special Topics in Disciplinary Neuroscience 3 May be repeated for credit; cumulative maximum 6 hours. Prereq graduate standing. Concepts and controversies in neuroscience that revolve around traditional approaches to nervous system study. May be repeated; cumulative maximum 6 hours.

543 Special Topics in Behavioral/Clinical Neuroscience 3 May be repeated for credit; cumulative maximum 6 hours. Concepts and controversies in neuroscience that involve normal and pathological aspects of behavior.

561 Biological Signal Processing 3 Introduction to computational neuroscience. Neurons and neuron models, basic signaling mechanisms of neurons, networks of neurons, learning models, learning model algorithms, weight-based memory models. The Hodgkin-Huxley model. A principal emphasis in this course is the development of quantitative models and analysis of neural systems. A term project is required. Recommended preparation: introductory course in linear algebra. Familiarity with at least one programming language. (Spring, alt/yrs).

590 Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Presented by advanced graduate students and faculty (both in VCAPP and around WSU) on their research areas.

592 Research Writing and Seminar 3 May be repeated for credit; cumulative maximum 6 hours. Written and oral communication of scientific information; formal instruction while preparing research proposals and departmental seminar.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

PSYCH

511 Analysis of Variance and Experimental Design 4 Prereq Psych 311 or statistics course. Parametric, nonparametric, repeated-measures, and multivariate ANOVA; planned comparisons; confidence intervals and power analysis; experimental design and variants.

512 Correlation, Regression, and Quasi-Experimental Design 3 Prereq Psych 511. Simple and multiple correlation and regression; time-series analysis; factor analysis; field research and quasi-experimental design.

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V PH

505 Design and Analysis of Biomedical Experiments 4 Prereq Math 107; Stat 212 or higher. Design of experiments with application to clinical and basic biomedical research; choosing, applying, and evaluating appropriate data analysis methods.

555 General and Cellular Physiology 4 (3-3) Prereq MBioS 303 or c//; MBioS 513. Physiochemical mechanisms of cellular function.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit. For MS in veterinary science only.

Veterinary Science - Veterinary and Comparative Anatomy, Pharmacology & Physiology

Degree offered: Master of Science in Veterinary Science - Non Thesis

Program Description

The College of Veterinary Medicine offers degrees leading to the MS and PhD (in addition to the professional DVM degree). The college is composed of two schools and three departments: the Paul G. Allen School for Global Animal Health, the School of Molecular Biosciences, the Department of Veterinary Clinical Sciences, the Department of Veterinary and Comparative Anatomy, Pharmacology and Physiology, and the Department of Veterinary Microbiology and Pathology. Each unit offers specialization in fields such as anatomy, cell biology, genetics, epidemiology, immunology, microbiology, and infectious diseases, pharmacology, physiology, reproductive biology, and structural biology. The School of Molecular Biosciences also offers a Professional Masters in Science program. Post-DVM clinical residents may specialize in areas such as anatomic and clinical pathology, anesthesiology, cardiology, clinical microbiology, internal medicine, neurology, ophthalmology, radiology, surgery, and theriogenology. For more information, please see the specific individual programs.

Veterinary Science - Veterinary Clinical Training Program

Degree offered: Doctor of Philosophy

Faculty working with graduate students: 14

Graduate students: 8

Graduate students receiving assistantships or scholarships: 100%

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

15 minimum graded credit hours if applicant already posesses a postgraduate degree (MS or DVM), students who do not have a postgraduate degree are required a minimum of 21 credit hours.

Program Description

The College of Veterinary Medicine offers degrees leading to the MS and PhD (in addition to the professional DVM degree). The college is composed of two schools and three departments: the Paul G. Allen School for Global Animal Health, the School of Molecular Biosciences, the Department of Veterinary Clinical Sciences, the Department of Veterinary and Comparative Anatomy, Pharmacology and Physiology, and the Department of Veterinary Microbiology and Pathology. Each unit offers specialization in fields such as anatomy, cell biology, genetics, epidemiology, immunology, microbiology, and infectious diseases, pharmacology, physiology, reproductive biology, and structural biology. The School of Molecular Biosciences also offers a Professional Masters in Science program. Post-DVM clinical residents may specialize in areas such as anatomic and clinical pathology, anesthesiology, cardiology, clinical microbiology, internal medicine, neurology, ophthalmology, radiology, surgery, and theriogenology. For more information, please see the specific individual programs.

Degree Description

The graduate program in the Department of Veterinary Clinical Sciences (VCS) at Washington State University is a plan of study leading to a doctoral degree, and to prepare the Resident for certification in his/her area of clinical assignment. The objectives of the program are to promote high standards of scholarly creativity, proficiency in a clinical discipline and professional service, experience in teaching, and independent and critical research. Areas of service and research may include: internal medicine, cardiology, ophthalmology, anesthesiology, neurology, surgery, radiology, clinical pathology, theriogenology, equine exercise physiology, exotic animal medicine, epidemiology, mastitis, and production medicine.

Training and Professional Development Opportunities

n/a

Post-Graduate Employment Opportunities

n/a

Contact Information

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Program Specialist 2
Veterinary Clinical Sciences
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Faculty

Andrew Allen, George Barrington, Margaret Davis, James Evermann, Lawrence Fox, John Gay, Ramanathan Kasimanickam, Katrina Mealey, Mushtaq Memon, Kathy Seino, Debra Sellon, Rance Sellon, William Sischo and Ahmed Tibary.

STAT

412 Statistical Methods in Research I 3 Prereq Stat 212, Math 140, 171, 202, or graduate standing. Intermediate statistical methods, design and analysis of research studies: completely randomized and randomized block designs, multiple regression, categorical data analysis.

Veterinary Clinical Medicine And Surgery

V MS

565 Oncology Journal Seminar 1 May be repeated for credit; cumulative maximum 6 hours. Prereq DVM or graduate standing. Small group discussion of veterinary literature, peer-reviewed literature and textbooks covering biological basis of cancer diagnosis, therapy and treatment.

573 Special Topics in Equine Surgery 1 May be repeated for credit; cumulative maximum 6 hours. Prereq DVM or graduate standing. Small group discussion and periodic laboratory/practical experience related to large animal surgery.

574 Cardiology Special Topics 1 May be repeated for credit; cumulative maximum 6 hours. Prereq DVM or graduate standing. Clinical cardiology topics and special problems; current medical or interventional information.

576 Introduction to Veterinary Clinical Research 2 Prereq DVM or graduate standing. Designing, executing, analyzing and reporting clinical research fundamental to practicing evidence-based medicine.

577 Applied Veterinary Physiology I 2 (0-2) Prereq DVM. Review of physiology as it relates to clinical veterinary medicine and specific diseases of animals through analysis of recent medical literature.

578 Applied Veterinary Physiology II 2 Prereq V MS 577; DVM. Continuation of V MS 577.

579 Oncology Rounds Seminar 1 May be repeated for credit; cumulative maximum 6 hours. Prereq DVM degree. Presentation and discussion of veterinary oncology cases include imaging, pathology, clinical pathology, appropriate diagnostic steps, therapy options and potential outcomes.

580 Advanced Clinical Pathology 1 May be repeated for credit; cumulative maximum 6 hours. Prereq DVM or graduate standing. Weekly small group discussion of laboratory and cytologic abnormalities in recent cases from the Veterinary Teaching Hospital.

582 Seminar in Clinical Medicine 1 May be repeated for credit. Prereq DVM degree or graduate standing.

584 Comparative Theriogenology V 1-2 May be repeated for credit; cumulative maximum 12 hours. Prereq DVM degree or graduate standing. May be repeated for credit; cumulative maximum 12 hours. Lectures from WSU College of Veterinary Medicine and Department of Animal Sciences and from UI Department of Animal and Veterinary Sciences.

585 Selected Topics in Advanced Clinical Neurology 1 or 2 May be repeated for credit; cumulative maximum 10 hours. Prereq DVM degree. Advanced veterinary neurology as applied to clinical practice.

586 Diagnostic Ultrasound 2 Prereq DMV or graduate standing. Diagnostic ultrasound and its application to clinical medicine in large and small animals.

587 Hospital Rotation 3 (0-9) May be repeated for credit; cumulative maximum 6 hours. Prereq DVM degree or graduate standing. Supervised practical experience in all service areas of the veterinary hospital.

589 Advanced Clinical Veterinary Medicine V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq DVM degree or graduate standing. Special topics.

590 Special Topics in Equine Medicine 1 May be repeated for credit; cumulative maximum 6 hours. Prereq DVM or graduate standing. Weekly small group discussion of problems in equine medicine, surgery or reproductive medicine using current or recent case material from the Veterinary Teaching Hospital.

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592 Seminar 1 May be repeated for credit.

593 Anesthesia Seminar 1 May be repeated for credit; cumulative maximum 6 hours. Prereq DMV degree or equivalent. Critical review of current topics in veterinary anesthesia.

596 Advanced Radiology 2 (1-3) May be repeated for credit; cumulative maximum 12 hours. Prereq DVM degree. Advanced study in the field of veterinary radiology and radiation treatment.

597 Diagnosis and Treatment of Surgically Correctable Soft Tissue Diseases in Small Animals V 1-2 May be repeated for credit; cumulative maximum 6 hours. Prereq DVM or permission. Review of recent advances in diagnosis and treatment of diseases in the field of small animal surgery.

598 Surgery Residents Seminar 1 May be repeated for credit. Prereq DVM degree. Surgery residents' and interns' presentations of case reports, literature reviews and research.

599 Critical Analysis of Veterinary Medicinal Information: Illusional Medicine 1 May be repeated for credit; cumulative maximum 6 hours. Prereq DVM or graduate standing. Weekly small group discussion, lecture and critical analysis of medical information.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit. For PhD in veterinary science only.

Veterinary Clinical Medicine And Surgery

V PH

505 Design and Analysis of Biomedical Experiments 4 Prereq Math 107; Stat 212 or higher. Design of experiments with application to clinical and basic biomedical research; choosing, applying, and evaluating appropriate data analysis methods.

Veterinary Science - Veterinary Clinical Training Program

Degree offered: Master of Science in Veterinary Science

Faculty working with graduate students: 14

Graduate students: 21

Graduate students receiving assistantships or scholarships: 100%

Tests required: TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: July 1

Requirements

In addition to course requirements, each student will be required to submit a minimum of one manuscript for publication to a peer-reviewed veterinary medical, human medical or basic science journal. This manuscript should be representative of some aspect of the specialty emphasis of that program.

Program Description

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Degree Description

The graduate program in the Department of Veterinary Clinical Sciences (VCS) at Washington State University is a plan of study leading to a master's degree and to prepare the Resident for certification in his/her area of clinical assignment. The objectives of the program are to promote high standards of scholarly creativity, proficiency in a clinical discipline and professional service, experience in teaching, and independent and critical research. Areas of service and research may include: internal medicine, cardiology, ophthalmology, anesthesiology, neurology, surgery, radiology, clinical pathology, theriogenology, equine exercise physiology, exotic animal medicine, epidemiology, mastitis, and production medicine.

Training and Professional Development Opportunities

n/a

Post-Graduate Employment Opportunities

n/a

Contact Information

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Faculty

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Veterinary Clinical Medicine And Surgery

V MS

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700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit. For MS in veterinary science only.

Veterinary Clinical Medicine And Surgery

V PH

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Veterinary Science - Veterinary Clinical Training Program

Degree offered: Master of Science in Veterinary Science - Non Thesis

Faculty working with graduate students: 14

Graduate students: 6

Graduate students receiving assistantships or scholarships: 100%

Tests required: TOEFL, TOEFLI

Deadline: Fall:
Spring:

Program Description

The College of Veterinary Medicine offers degrees leading to the MS and PhD (in addition to the professional DVM degree). The college is composed of two schools and three departments: the Paul G. Allen School for Global Animal Health, the School of Molecular Biosciences, the Department of Veterinary Clinical Sciences, the Department of Veterinary and Comparative Anatomy, Pharmacology and Physiology, and the Department of Veterinary Microbiology and Pathology. Each unit offers specialization in fields such as anatomy, cell biology, genetics, epidemiology, immunology, microbiology, and infectious diseases, pharmacology, physiology, reproductive biology, and structural biology. The School of Molecular Biosciences also offers a Professional Masters in Science program. Post-DVM clinical residents may specialize in areas such as anatomic and clinical pathology, anesthesiology, cardiology, clinical microbiology, internal medicine, neurology, ophthalmology, radiology, surgery, and theriogenology. For more information, please see the specific individual programs.

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n/a

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600 **Special Projects or Independent Study** V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 **Master's Special Problems, Directed Study, and/or Examination** V 1 (0-3) to 18 (0-54) May be repeated for credit.

Veterinary Clinical Medicine And Surgery

V PH

505 **Design and Analysis of Biomedical Experiments** 4 Prereq Math 107; Stat 212 or higher. Design of experiments with application to clinical and basic biomedical research; choosing, applying, and evaluating appropriate data analysis methods.

Zoology

Degree offered: Doctor of Philosophy (Zoology)

Faculty working with graduate students: 24

Graduate students: 18

Graduate students receiving assistantships or scholarships: 100%

Tests required: GRE (Combined), TOEFL, TOEFLI

Deadline: Fall: January 10
Spring: September 1

Requirements

Proposal defenseExit seminar

Program Description

The School of Biological Sciences offers a rigorous and competitive degree in Zoology. Students who complete this degree are successful in a broad variety of careers, including those in: research universities, teaching colleges, federal and state government and the private sector.

Degree Description

Our zoology students generally focus on research in the broad areas of ecology, evolution, systematics, molecular biology, and animal physiology.

Training and Professional Development Opportunities

Our program offers teaching training and grant writing courses. Other professional development opportunities include weekly reading groups, ecolunch meetings and a graduate student research symposium.

Post-Graduate Employment Opportunities

Most students continue into postdoctoral research positions. Other students pursue careers at community colleges or in Federal or State governments.

Post-Graduate Career Placements

Faculty positions at Purdue University, Kansas State University, University of North Carolina, University of Massachusetts, University of Idaho, University of Wyoming, State University of NY at Oswego, and University of Puget Sound. Recent graduates also hold positions in the Federal Government, such as National Park Service, US Fish and Wildlife Service and Bureau of Land Management.

Contact Information

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Linda Thompson
Graduate Coordinator
School of Biological Sciences
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Fax: 509-335-3184
E-mail: linder@wsu.edu

Faculty

Jesse Brunner, Patrick Carter, Erica Crespi, Mark Dybdahl, Richard Gomulkiewicz, Donna Holmes, Brian Kemp, Raymond Lee, Jon Mallatt, Michelle McGuire, David Moffett, Ruth Newberry, Jeb Owen, Christine Portfors, Charles Robbins, Buel Rodgers, Hubertus Schwabl, Elissa Schwartz, Lisa Shipley, Michael Skinner, William Snyder, Andrew Storfer, Gary Thorgaard and Paul Verrell.

Animal Sciences

A S

551 **Endocrine Physiology** 3 Graduate-level counterpart of A S 451; additional requirements. Credit not granted for both A S 451 and 551.

Animal Sciences

ANTH

547 **Models and Simulation** 3 Models and model-building as an anthropological approach to present and past cultures.

Animal Sciences

BIOL

500 **Seminar** 1 May be repeated for credit. Prereq 20 hours Biol.

501 **Proposal Defense Seminar** 2 Research proposal defense as part of the preliminary examination for candidacy in the Ph.D. program.

504 **Experimental Methods in Plant Physiology** 3 (2-3) Advanced techniques and instrumental methods applicable to research in plant physiology.

509 **Plant Anatomy** 4 (2-6) Graduate-level counterpart of Biol 409; additional requirements. Credit not granted for both Biol 409 and 509.

511 **Reproductive Biology of Fishes** 2 Prereq graduate standing. Covering all aspects of the reproductive biology of fishes. The class will meet once per week for 2 hours; the first hour will be used for a formal lecture, the second hour will be used for informal student presentations/discussion of current literature topics or assigned readings in the field. (Spring only, Alt/yrs).

512 **Molecular Mechanisms of Plant Development** 3 Prereq Biol 320. Physiology of growth; metabolism during development and reproduction.

513 **Plant Metabolism** 3 Prereq Biol 320, MBioS 303. Metabolic processes unique to plants, including the primary incorporation of nitrogen, sulfur, carbon dioxide and phosphate into bio-molecules.

514 **Fish Genetics** 2 Prereq Biol 301. Chromosomal, biochemical, quantitative, and ecological aspects of fish genetics with emphasis on applications to aquaculture and fish management.

515 **Fish Physiology** 2 Prereq Fish 511 and permission. Principles and methods used to study vital organs, organ systems, growth, and reproduction of fishes; emphasis on osmoregulation, metabolism, endocrinology, and respiration.

517 Stress Physiology of Plants 3 Prereq graduate standing. Temperature, light, salinity, water effects on physiological processes; mechanistic understanding of stress.

519 Introduction to Population Genetics 3 Prereq Biol 301. Survey of basic population and quantitative genetics.

520 Conservation Genetics 2 Prereq Biol 301. Genetic studies and approaches relevant to efforts to conserve threatened and endangered populations of organisms.

521 Quantitative Genetics 3 Prereq Biol 519 or permission of instructor. Fundamentals of quantitative genetics; evolutionary quantitative genetics.

523 Advanced Fishery Management 3 Contemporary management of marine and freshwater fish and shellfish populations of the world. Approaches, factors, and models used to manage commercial, recreational and subsistence fisheries; and the policy interface of biological systems with governmental and social institutions. (Spring, Alt/yrs).

531 Principles of Systematic Biology 3 Prereq graduate standing. Systematic theory; history and current views; approaches to phylogenetic analysis and classification.

533 Modern Methods in Systematics 4 (2-6) Selecting, gathering, and analyzing morphological, cytological, molecular data for phylogenetic and evolutionary studies.

537 Plant Cell Biology 3 Prereq graduate standing. Structure and function of plant cells including membrane biology, protein targeting and molecular signaling with emphasis on current research.

540 Stable Isotope Theory and Methods 3 (2-3) Prereq graduate standing. Theory and practice of measuring stable isotope ratios of biologically important elements; training in the use of isotope mass spectrometers.

544 Nitrogen Cycling in the Earth's Systems 3 Prereq graduate standing. Nitrogen dynamics in terrestrial, aquatic, and atmospheric systems; nitrogen transformations in natural and managed systems and responses to human activities.

548 Evolutionary Ecology of Populations 3 Evolutionary dynamics of natural populations and the co-evolution of species.

556 Biochemical Adaptation 3 Prereq graduate standing. Relationships between enzyme/macromolecule adaptation and animal performance.

559 Hormones, Brain and Behavior 3 Prereq upper-division biology, psychology or anthropology course. Classical behavioral endocrinology from molecular to whole organisms, integrating evolutionary ecology, neuroethology and behavioral neuroendocrinology.

560 Plant Ecophysiology 3 Prereq graduate standing. Relationships of biotic and abiotic environment to plant distribution and evolution through study of physiological processes.

561 Environmental Physiology 3 Prereq graduate standing. Individual and evolutionary adaptations to changing environments with emphasis on recent literature.

563 Field Ecology 2 (0-6) Prereq Biol 562. Field implementation of descriptive and experimental techniques to quantify the structure, composition, and interactions within natural communities. Field trips required.

564 Molecular Ecology and Phylogeography 3 Prereq Biol 301 or equivalent; Biol 405 or equivalent. Use of genetic markers for the study of ecological phenomena, including kinship, population structure, and phylogeography.

566 Mathematical Genetics 3 Prereq graduate standing. Same as Math 563.

567 Ecological Restoration 3 Prereq graduate standing or by permission. Introduction to major issues in restoration ecology; major ecological dimensions of restoration.

568 Conservation Ecology 3 Prereq Graduate standing. Diagnosis of endangered species, population viability analysis, invasive species ecology, landscape ecology and ecosystem management.

569 Ecosystem Ecology and Global Change 3 Prereq graduate standing. Graduate-level counterpart of Biol 469; additional requirements. Credit not granted for both Biol 469 and 569.

570 Diversity of Plants 3 Prereq graduate standing. Morphological, life history, and ecological diversity of major plant clades; emphasis on principles of homology, character transformation, and macroevolution.

581 Comparative Biology of Social Traditions 3 Prereq Anth 260 or Biol 106; senior or graduate standing. Same as Anth 581.

582 Professional Communication in Biology 2 Prereq graduate standing. Mechanics and style of publishing biological findings; adaptation of writing to various venues and audiences.

589 Advanced Topics in Biology V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent advances in biology.

591 Seminar in Molecular Plant Sciences 1 May be repeated for credit. Same as MPS 515.

593 Seminar I 1 May be repeated for credit. Literature and problems.

597 Teaching Practicum V 1-4 May be repeated for credit; cumulative maximum 4 hours. Zoology laboratory teaching internship.

598 IPEM Seminar 1 May be repeated for credit; cumulative maximum 6 hours. Prereq IGERT fellow. Same as Anth 596.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

800 Doctoral Research, Dissertation, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Animal Sciences

E MIC

586 Special Projects in Electron Microscopy V 2 (0-6) to 3 (0-9) May be repeated for credit. Practical training in one or more areas of electron microscopy; TEM, SEM, ultramicrotomy, specimen processing; confocal flourescent microscopy.

587 Special Topics in Electron Microscopy 1 May be repeated for credit; cumulative maximum 4 hours.

Natural Resource Sciences

NATRS

519 Advanced Topics V 1-3 May be repeated for credit; cumulative maximum 6 hours.

Natural Resource Sciences

SOILS

514 Environmental Biophysics 2 Prereq Math 107. Graduate-level counterpart of SoilS 414; additional requirements. Credit not granted for both SoilS 414 and 514.

515 Environmental Biophysics Laboratory 1 (0-3) Prereq SoilS 414 or c//. Graduate-level counterpart of SoilS 415; additional requirements. Credit not granted for both SoilS 415 and 515.

Natural Resource Sciences

STAT

512 Statistical Methods in Research II 3 (2-2) Prereq Stat 412 or equivalent. Analysis and interpretation of designed experiments: CRD, RCBD, spit-plot and repeated measures, multiple comparisons, multiple regression modeling, validation of assumptions.

514 Nonparametric Statistics 3 Prereq Stat 512. Conceptual development of nonparametric methods including one, two, and k-sample tests for location and scale, randomized complete blocks, rank correlation, and runs test; power, sample size, efficiency, and ARE.

530 Applied Linear Models 3 (2-2) Prereq Stat 360 or 412. The design and analysis of experiments by linear models.

Natural Resource Sciences

V PH

555 General and Cellular Physiology 4 (3-3) Prereq MBioS 303 or c//; MBioS 513. Physiochemical mechanisms of cellular function.

Zoology

Degree offered: Master of Science in Zoology

Faculty working with graduate students: 24

Graduate students: 9

Graduate students receiving assistantships or scholarships: 100%

Tests required: GRE (Combined), TOEFL

Deadline: Fall: January 10
Spring: September 1

Requirements

Exit seminar

Program Description

The School of Biological Sciences offers a rigorous and competitive degree in Zoology. Students who complete this degree are successful in a broad variety of careers, including those in: research universities, teaching colleges, federal and state government and the private sector.

Degree Description

Our zoology students generally focus on research in the broad areas of ecology, evolution, systematics, molecular biology, and animal physiology.

Training and Professional Development Opportunities

Our program offers college teaching training, as well as a grant writing seminar. Training opportunities also exist through numerous reading groups, a biology graduate research symposium, an ecolunch and frequent seminars.

Post-Graduate Employment Opportunities

Many students that complete MS degrees in Zoology go on to PhD programs at competitive universities. Others teach at community colleges or private schools. Some also work for federal and state agencies, as well as in the private sector.

Post-Graduate Career Placements

Former MS students in Zoology are now in careers with the US Forest Service, NOAA and the US Geological Survey. Other recent graduates are private consultants, professional writers and some work at zoos.

Contact Information

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Linda Thompson
Graduate Coordinator
School of Biological Sciences
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Fax: 509-335-3184
E-mail: linder@wsu.edu

Faculty

Jesse Brunner, Patrick Carter, Erica Crespi, Mark Dybdahl, Richard Gomulkiewicz, Donna Holmes, Brian Kemp, Raymond Lee, Jon Mallatt, Michelle McGuire, David Moffett, Ruth Newberry, Jeb Owen, Christine Portfors, Charles Robbins, Buel Rodgers, Hubertus Schwabl, Elissa Schwartz, Lisa Shipley, Michael Skinner, William Snyder, Andrew Storfer, Gary Thorgaard and Paul Verrell.

Animal Sciences

A S

551 Endocrine Physiology 3 Graduate-level counterpart of A S 451; additional requirements. Credit not granted for both A S 451 and 551.

Animal Sciences

ANTH

547 Models and Simulation 3 Models and model-building as an anthropological approach to present and past cultures.

Animal Sciences

BIOL

500 Seminar 1 May be repeated for credit. Prereq 20 hours Biol.

504 Experimental Methods in Plant Physiology 3 (2-3) Advanced techniques and instrumental methods applicable to research in plant physiology.

509 Plant Anatomy 4 (2-6) Graduate-level counterpart of Biol 409; additional requirements. Credit not granted for both Biol 409 and 509.

511 Reproductive Biology of Fishes 2 Prereq graduate standing. Covering all aspects of the reproductive biology of fishes. The class will meet once per week for 2 hours; the first hour will be used for a formal lecture, the second hour will be used for informal student presentations/discussion of current literature topics or assigned readings in the field. (Spring only, Alt/yrs).

512 Molecular Mechanisms of Plant Development 3 Prereq Biol 320. Physiology of growth; metabolism during development and reproduction.

513 Plant Metabolism 3 Prereq Biol 320, MBioS 303. Metabolic processes unique to plants, including the primary incorporation of nitrogen, sulfur, carbon dioxide and phosphate into bio-molecules.

514 Fish Genetics 2 Prereq Biol 301. Chromosomal, biochemical, quantitative, and ecological aspects of fish genetics with emphasis on applications to aquaculture and fish management.

515 Fish Physiology 2 Prereq Fish 511 and permission. Principles and methods used to study vital organs, organ systems, growth, and reproduction of fishes; emphasis on osmoregulation, metabolism, endocrinology, and respiration.

517 Stress Physiology of Plants 3 Prereq graduate standing. Temperature, light, salinity, water effects on physiological processes; mechanistic understanding of stress.

519 Introduction to Population Genetics 3 Prereq Biol 301. Survey of basic population and quantitative genetics.

520 Conservation Genetics 2 Prereq Biol 301. Genetic studies and approaches relevant to efforts to conserve threatened and endangered populations of organisms.

521 Quantitative Genetics 3 Prereq Biol 519 or permission of instructor. Fundamentals of quantitative genetics; evolutionary quantitative genetics.

523 Advanced Fishery Management 3 Contemporary management of marine and freshwater fish and shellfish populations of the world. Approaches, factors, and models used to manage commercial, recreational and subsistence fisheries; and the policy interface of biological systems with governmental and social institutions. (Spring, Alt/yrs).

531 Principles of Systematic Biology 3 Prereq graduate standing. Systematic theory; history and current views; approaches to phylogenetic analysis and classification.

533 Modern Methods in Systematics 4 (2-6) Selecting, gathering, and analyzing morphological, cytological, molecular data for phylogenetic and evolutionary studies.

537 Plant Cell Biology 3 Prereq graduate standing. Structure and function of plant cells including membrane biology, protein targeting and molecular signaling with emphasis on current research.

540 Stable Isotope Theory and Methods 3 (2-3) Prereq graduate standing. Theory and practice of measuring stable isotope ratios of biologically important elements; training in the use of isotope mass spectrometers.

544 Nitrogen Cycling in the Earth's Systems 3 Prereq graduate standing. Nitrogen dynamics in terrestrial, aquatic, and atmospheric systems; nitrogen transformations in natural and managed systems and responses to human activities.

548 Evolutionary Ecology of Populations 3 Evolutionary dynamics of natural populations and the co-evolution of species.

556 Biochemical Adaptation 3 Prereq graduate standing. Relationships between enzyme/macromolecule adaptation and animal performance.

559 Hormones, Brain and Behavior 3 Prereq upper-division biology, psychology or anthropology course. Classical behavioral endocrinology from molecular to whole organisms, integrating evolutionary ecology, neuroethology and behavioral neuroendocrinology.

560 Plant Ecophysiology 3 Prereq graduate standing. Relationships of biotic and abiotic environment to plant distribution and evolution through study of physiological processes.

561 Environmental Physiology 3 Prereq graduate standing. Individual and evolutionary adaptations to changing environments with emphasis on recent literature.

563 Field Ecology 2 (0-6) Prereq Biol 562. Field implementation of descriptive and experimental techniques to quantify the structure, composition, and interactions within natural communities. Field trips required.

564 Molecular Ecology and Phylogeography 3 Prereq Biol 301 or equivalent; Biol 405 or equivalent. Use of genetic markers for the study of ecological phenomena, including kinship, population structure, and phylogeography.

566 Mathematical Genetics 3 Prereq graduate standing. Same as Math 563.

567 Ecological Restoration 3 Prereq graduate standing or by permission. Introduction to major issues in restoration ecology; major ecological dimensions of restoration.

568 Conservation Ecology 3 Prereq Graduate standing. Diagnosis of endangered species, population viability analysis, invasive species ecology, landscape ecology and ecosystem management.

569 Ecosystem Ecology and Global Change 3 Prereq graduate standing. Graduate-level counterpart of Biol 469; additional requirements. Credit not granted for both Biol 469 and 569.

570 Diversity of Plants 3 Prereq graduate standing. Morphological, life history, and ecological diversity of major plant clades; emphasis on principles of homology, character transformation, and macroevolution.

581 Comparative Biology of Social Traditions 3 Prereq Anth 260 or Biol 106; senior or graduate standing. Same as Anth 581.

582 Professional Communication in Biology 2 Prereq graduate standing. Mechanics and style of publishing biological findings; adaptation of writing to various venues and audiences.

589 Advanced Topics in Biology V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent advances in biology.

591 Seminar in Molecular Plant Sciences 1 May be repeated for credit. Same as MPS 515.

593 Seminar I 1 May be repeated for credit. Literature and problems.

597 Teaching Practicum V 1-4 May be repeated for credit; cumulative maximum 4 hours. Zoology laboratory teaching internship.

598 IPEM Seminar 1 May be repeated for credit; cumulative maximum 6 hours. Prereq IGERT fellow. Same as Anth 596.

600 Special Projects or Independent Study V 1 (0-3) to 18 (0-54) May be repeated for credit.

700 Master's Research, Thesis, and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

702 Master's Special Problems, Directed Study and/or Examination V 1 (0-3) to 18 (0-54) May be repeated for credit.

Animal Sciences

E MIC

586 Special Projects in Electron Microscopy V 2 (0-6) to 3 (0-9) May be repeated for credit. Practical training in one or more areas of electron microscopy; TEM, SEM, ultramicrotomy, specimen processing; confocal flourescent microscopy.

587 Special Topics in Electron Microscopy 1 May be repeated for credit; cumulative maximum 4 hours.

Natural Resource Sciences

NATRS

519 Advanced Topics V 1-3 May be repeated for credit; cumulative maximum 6 hours.

Natural Resource Sciences

SOILS

514 Environmental Biophysics 2 Prereq Math 107. Graduate-level counterpart of SoilS 414; additional requirements. Credit not granted for both SoilS 414 and 514.

515 Environmental Biophysics Laboratory 1 (0-3) Prereq SoilS 414 or c//. Graduate-level counterpart of SoilS 415; additional requirements. Credit not granted for both SoilS 415 and 515.

Natural Resource Sciences

STAT

512 Statistical Methods in Research II 3 (2-2) Prereq Stat 412 or equivalent. Analysis and interpretation of designed experiments: CRD, RCBD, spit-plot and repeated measures, multiple comparisons, multiple regression modeling, validation of assumptions.

514 Nonparametric Statistics 3 Prereq Stat 512. Conceptual development of nonparametric methods including one, two, and k-sample tests for location and scale, randomized complete blocks, rank correlation, and runs test; power, sample size, efficiency, and ARE.

Natural Resource Sciences

V PH

555 General and Cellular Physiology 4 (3-3) Prereq MBioS 303 or c//; MBioS 513. Physiochemical mechanisms of cellular function.

Zoology

Degree offered: Master of Science in Zoology - Non Thesis

Faculty working with graduate students: 17

Program Description

The School of Biological Sciences offers a rigorous and competitive degree in Zoology. Students who complete this degree are successful in a broad variety of careers, including those in: research universities, teaching colleges, federal and state government and the private sector.

Degree Description

Our zoology students generally focus on research in the broad areas of ecology, evolution, systematics, molecular biology, and animal physiology.

Faculty

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