

Washington State University
MAJOR CURRICULAR CHANGE FORM -- NEW/RESTORE COURSE

- ☐ Please attach rationale for your request, a complete syllabus, and explain how this impacts other units in Pullman and other campuses (if applicable).
- ☐ Obtain all required signatures with dates.
- ☐ Provide original stapled packet of signed form/rationale statement/syllabus PLUS 10 stapled copies of complete packet to the Registrar's Office, campus mail code 1035.
- ☐ Submit one electronic copy of complete packet to wsu.curriculum@wsu.edu.

Requested Future Effective Date: Fall 2016 (term/year) Course Typically Offered: Fall

DEADLINES: For fall term effective date: **October 1st**; for spring or summer term effective date: **February 1st**. See instructions.

NOTE: Items received after deadlines may be put to the back of the line or forwarded to the following year. Please submit on time.

☒ **New Course**

☐ **Temporary Course**

☐ **Restore Course**

PharmSci 560 Molecular & Cellular Methods in Biomedical Sciences
course subject/crosslist course no. title

3 (3 - 0) Graduate standing or permission of the instructor

Credit hrs	lecture hrs per week	lab or studio hrs per week	prerequisite

Description for catalog: Basic experimental methods and approaches in cell and molecular biology, with an emphasis on practical skills and their appropriate application.

Additional Attributes: Check all that apply.

☐ Crosslisting (between WSU departments)*

☐ Conjoint listing (400/500): _____

☐ Variable credit: _____

☐ Repeat credit (cum. max. hrs): _____

Special Grading: ☐ S, F; ☐ A, S, F (PEACT only); ☐ S, M, F (VET MED only); ☐ H, S, F (PHARMACY, PHARDSCI only)

☐ Cooperative with UI

☐ Other (please list request): _____

The following items require prior submission to other committees/depts. (SEE INSTRUCTIONS.)

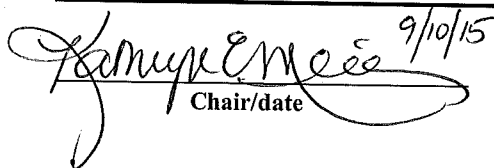
☐ Request to meet Writing in the Major [M] requirement (Must have All-University Writing Committee Approval.)

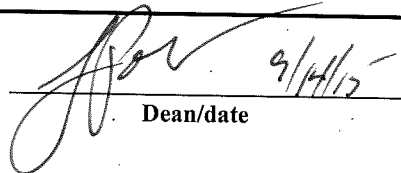
☐ Request to meet UCORE in _____ (Must have UCORE Committee Approval >> See instructions.)

☐ Special Course Fee _____ (Must submit request to University Receivables.)

Contact: Kathryn Meier, PhD Phone number: (509) 358-7631 Campus mail code: 1495

Email: kmeier@wsu.edu Instructor, if different: Shuwen Wang, PhD

 9/10/15
Chair/date

 9/14/15
Dean/date

All-University Writing Com / date

Chair (if crosslisted/interdisciplinary)*

Dean (if crosslisted/interdisciplinary)*

UCORE Committee Approval Date

Catalog Subcommittee Approval Date

GSC or AAC Approval Date

Faculty Senate Approval Date

***If the proposed change impacts or involves collaboration with other units, use the additional signature lines provided for each impacted unit and college.**

Rationale for new course (PharmSci 560)

The graduate program in Pharmaceutical Sciences continues to develop new coursework to meet the needs of the PhD students being trained in Spokane. The overall goal is to offer sufficient coursework on the Spokane campus so that students can take all of their required courses and electives on site. Students can still opt to take Pullman-based courses as electives, by telecommunication or online, but we intend to offer all of the required courses, including electives, in Spokane.

The proposed course is the first methods-based course in molecular and cellular biology taught on the Spokane campus. It is being offered under the course number PharmSci 512 (Topics in Pharmacology) for Fall 2015. The course has proven to be very popular, with 9 students currently enrolled. This course has been attracting the interest of PhD students working on the Spokane campus who are enrolled in other degree programs (e.g., Molecular Biosciences). In this course, Dr. Wang is carefully explaining both theory and practice for methods commonly used in basic science laboratories. Dr. Wang and her co-instructors are personally very familiar with these techniques, and manage instrumentation core facilities on the Spokane campus. To our knowledge, there is no overall duplication between this course and other WSU graduate courses, although undoubtedly some of the individual topics are addressed in other courses.

Given the very positive roll-out of this course on a provisional basis, we are requesting that it be added to the catalog as a new course under the designation PharmSci 560.

PHARMSCI 560: Molecular & Cellular Methods in Biomedical Sciences

College of Pharmacy
Washington State University Spokane
Fall 2016

Course Logistics

Course Title:	Molecular and Cellular Methods in Biomedical Sciences	
Course Number:	PHARMSCI 560	
Credits:	3	
Pre-requisites:	Graduate standing or permission of the instructor	
Course Description:	Basic experimental methods and approaches in cell and molecular biology, with an emphasis on practical skills and their appropriate application	
Academic Hours:	3-0-3 (Lecture/In-class Discussion-Lab-Total)	
Semester:	Fall	
Course Time and Location:	Thursdays, 1 – 3:30 pm, SAC 341	
Office Hours:	TBA	
Instructor of Record:	Shuwen Wang, Ph.D. Pharmaceutical Sciences Office: PBS 311 Ph: 509-368 6571 Email: shuwen.wang@wsu.edu	
Participating Instructors:	Hui Zhang, Ph.D. Pharmaceutical Sciences Office: PBS 417 Ph: 509-368 6580 Email: hzhang@wsu.edu	Zhenjia Wang, Ph.D. Pharmaceutical Sciences Office: PBS 315 Ph: 509-368 6563 Email: zhenjia.wang@wsu.edu

Course Communication:

The College of Pharmacy now relies on Blackboard as our primary Learning Management System. You can log on to Blackboard at: <https://learn.wsu.edu/webapps/login/>. Click on the “WSU Authentication” and type in your WSU Network ID and password to access Blackboard. Your courses should be automatically pre-loaded based on enrollment. If you have difficulty finding one of your courses within Blackboard, contact the instructor for the course, or you can reach Pharmacy IT at 509-358-7609.

You can become more acquainted with Blackboard by viewing the student orientation video that was also distributed over the summer months:
<https://www.youtube.com/watch?v=36kDE4lvRml&index=1&list=PLontYaReEU1seUE3ACG3sEc3zR7Br7URU>. There is also an “On Demand Help” feature you can utilize located on the bottom of the web page after you log on to the Blackboard site.

Course Objectives:

This course introduces the entering and early year graduate students in College of Pharmacy to the basic laboratory techniques in molecular and cell biology, allowing them to be well prepared for their ongoing rotations and future laboratory based thesis projects. Students will be introduced to the basic 'gold standard' experimental procedures in molecular and cell biology, including bench methods for DNA, RNA, protein, and cells/tissues. The lectures and assigned readings will cover the theory of basic laboratory techniques central to molecular and cellular biological applications and the latest methods that are driving the fields of genomics. There will be 3 methods-based assessments. Participation is mandatory and in-class discussion highly encouraged, both of which will count towards the final grade for each student.

Upon completion of the course, students will develop practical laboratory skills and an understanding of the techniques used in molecular and cellular biology to investigate biological problems. Specifically, students should be able to do the following: [method of assessment is provided in brackets]

1. Explain the theory of basic techniques used in molecular and cell biology [in-class discussion; written assignment/exams]
2. Master safe laboratory practices of basic molecular biology techniques [in-class discussion]
3. Master safe laboratory practices of basic cell biology techniques [in-class discussion]
4. Develop necessary skills to design and carry out experiments [in-class discussion; written assignment/exams]
5. Develop trouble-shooting ability and explain how to use proper controls [in-class discussion; written assignment/exams]
6. Develop the skills for data analysis and interpretation of experimental results [in-class discussion; written assignment/exams]
7. Be able to plan and perform multiple experiments/projects efficiently [in-class discussion]

Required and Optional Textbooks, References and other resources**Recommended References:**

- *Molecular Cloning: A Laboratory Manual, 4th Edition*, ed. by M. Green and J. Sambrook, CSHL Press (2012)
- NEB (NEB Cutter 2.0, catalog, Double Finder, website)
- Rebase <http://rebase.neb.com>
- Gene Construction Kit (software)
- [IDT SciTools® Web Tools](#)

Additional reading materials will be assigned by instructors as needed to support the learning objectives of individual topics and will be posted on Blackboard prior to the class session.

Class Format and Schedule

This course covers basic experimental methods and approaches in cell and molecular biology. Thus, instruction in this course will be largely discussion-based format with introductory lectures to review relevant background on each topic. It is expected that students will complete the required reading(s) for each topic prior to the class so as to participate fully in class discussions of experimental practices.

Week	Date	Topic	Instructor
1	Aug 27	Course Introduction History of modern molecular biology	S. Wang

2	Sept 3	Module I. DNA technologies i. Purification and quantification of DNA ii. Analysis and characterization of DNA (incl. Southern and Northern)	H. Zhang
3	Sept 10	iii. Vector construction and recombinant DNA	H. Zhang
4	Sept 17	Module II. RNA technologies i. Isolation, quantification, and analysis of RNA	H. Zhang
5	Sept 24	ii. Applications (RT-PCR, RNAi, miRNA)	H. Zhang
	Due Sept 30	Exam/assignment I (material from weeks 1-5)	
6	Oct 1	Module III. PCR technologies i. Basics and conventional PCR applications	S. Wang
7	Oct 8	ii. Real-time PCR and applications	S. Wang
8	Oct 15	Module IV. Protein technologies i. Expression, purification and quantification	S. Wang
9	Oct 22	ii. Analysis and detection (SDS-PAGE, Western Blot, ELISA)	S. Wang
	Due Oct 28	Exam/assignment II (material from weeks 6-9)	
10	Oct 29	Module V. Cell culture technologies i. Basics and applications (Sterile Techniques; maintaining, passaging, and freezing cells)	S. Wang
11	Nov 5	ii. Transfection (both transient and stable) and applications (reporter assays)	S. Wang
12	Nov 12	iii. Cell imaging (Immunohistochemistry, staining, live cell imaging)	Z. Wang
13	Nov 19	Module VI. Introduction to 21st century biological technologies (ChIP/Epigenetics, BAC, NGS, CRISPR-CAS9) i. Chromatin IP (ChIP)	S. Wang
	Due Nov 25	Exam/assignment III (material from weeks 10-13)	
	Nov 26	***Thanksgiving Break***	
14	Dec 3	Research project examples utilizing covered methods (I)	S. Wang
15	Dec 10	Research project examples utilizing covered methods (II)	S. Wang

Expectations of Students

Students are expected to attend classes, and are responsible for all material presented in each class plus any additional material as directed by the instructor. "Make-up assignments/exams" will be scheduled only under the most extraordinary circumstances, after receiving approval of the instructor prior to the assignment/exam.

Grading Scale:

A = 93-100%	C = 73-76%
A- = 90-92%	C- = 70-72%
B+ = 87-89%	D+ = 67-69%
B = 83-86%	D = 60-66%
B- = 80-82%	F = < 60%
C+ = 77-79%	

In calculating final grades, percentages will be rounded to the nearest whole number.

Examinations

There will be three written assignments/examinations, each comprising 25% of the final grade. Each assignment/exam will consist of small experimental projects relevant to the topics covered in each module. In addition, in-class participation and discussion will contribute towards 25% of the final grade in the course.

The due dates and contributions of each piece of assessment to the final grade are as follows:

Assessment	Percent	Due dates and times
DNA and RNA technologies	25%	Sept 30, 5 pm
PCR and protein technologies	25%	Oct 28, 5 pm
Cell culture and new technologies	25%	Nov 25, 5 pm
In class-discussion and participation	25%	n/a
Total	100%	

In-class discussions

There will be in-class discussions of method articles, assigned by the instructor, on a weekly basis or at the discretion of the instructor. Each student will be expected to present one technique from the assigned papers, and to participate in the discussion of the methods.

Besides, each student will need to find a recent method paper, related to the lecture content, for discussion each week. During the discussion, each student will provide a brief introduction to the technique he/she picked, and then go over the procedure of the technique. Each student will be expected to explain the technique, including pros and cons, and its applications in scientific projects; other students will be encouraged to give input as well. The overall format will be informal, although participation is expected and required. The purpose of this graduate method course is to provide good practices of laboratory techniques that are often essential for graduate thesis projects. Therefore, students will be expected to explain the method article, including

1. The goal of the experiment
2. The methods employed
3. The meaning of the results shown in the figures

Students will be assigned a grade for the in-class discussions based on attendance and participation.

Rubric for grading the in-class discussions:

1. 5 points: attendance; providing a valid excuse if unable to attend
2. 10 points: preparation; familiarity with the paper as reflected in general discussion, even if issues remain to be clarified regarding methodology and details
3. 10 points: critical thinking as reflected in discussion

Written Assignments/Examinations

Purpose: To broaden course participation beyond the traditional close-book exam format and to build critical thinking skills relevant to covered course materials.

Due dates: Each written assignment/examination is due on its designated date by 5 pm; it can be submitted to the instructor by email.

The assignments are open-book examinations and will be related to the materials covered in their respective modules as indicated in the course content and schedule. Each assignment will consist of several biological problems that need to be addressed with experimental methods learned in class, including methods of choice, proper controls, data prediction, as well as potential caveats of the experiments. Students are encouraged to provide alternative approaches to investigate the same biological questions.

Each assignment is individual work, completed outside of classroom. Any signs of similar writing and copying each other's work will result in a poor or failing grade. Each assignment, 25 points total, will comprise 25% of the final grade. Rubric for grading each written assignment is as follows.

5 points: Following the directions provided, i.e. turned in on time

5 points: Choice of method(s) and proper planning of experimental procedures

5 points: Inclusion of proper controls and selection of reagents, supplies, and equipment

5 points: Prediction of results and trouble shooting ability; alternative approaches

5 points: Interpret and analyze various scenarios of results

Additional Comments

Class Format and Schedule: This is a graduate course that includes both didactic (lecture-based) delivery and in-class discussion. Instructors will use various methods to encourage student participation of in-class discussion. All work in the course is individual in nature, which means that the student may not obtain assistance from others in the completion of an assignment. Individual assignments will specify the types of resources to be used.

Methodology: Lectures, in-class discussions, and written assignment.

Academic Honesty, Conduct, and Behavior

Student Conduct Code and Standards of Professionalism

The WSU Standards of Conduct for Students (Student Conduct Code) is in the WSU Spokane 2010-2011 Student Handbook, and also at www.conduct.wsu.edu/default.asp?PageID=338 (Chapter 504-26 WAC). Any violation of the Student Conduct Code is a disciplinary issue and is within the jurisdiction of the Office of Student Conduct. As such, the Conduct officers or Conduct Board make decisions on sanctions for violations of the code.

Grievance Procedures

Appeal procedures for students who have been sanctioned under the WSU Student Conduct Code are set forth in the Student Conduct Code, WAC 504-26-407 found at <http://apps.leg.wa.gov/WAC/default.aspx?cite=504-26-407>

It is the responsibility of students and faculty to promote academic integrity and intellectual honesty. All assignments should demonstrate independent effort and thought unless otherwise instructed. Evidence of cheating, copying of homework, working as a group on an independent assignment, plagiarism, or not citing references properly will result in a conference with the instructor. The possible consequences of breaching academic integrity include the following: failing grade on the quiz or

assignment, a full letter grade drop for the course, or a failing grade in the course. The student will also be referred immediately to the office of the Dean and/or the WSU Office of Student Conduct.

Course Evaluations

Student evaluations of courses/course modules and faculty effectiveness are a valuable and important component of the College's commitment to provide quality learning experiences and contribute to our efforts to assure that students achieve the objectives of our professional degree program. Thus, all evaluations are given serious consideration as part of the assessment process and are read first by the Department Chair before they are processed, analyzed, and given to the faculty. Because the most effective way to impact positive changes is through constructive comments, we encourage you to provide feedback as you would wish to receive it. This will allow the faculty member to focus on improvements or affirm students' perspective on effective elements of the course.

Students with Disabilities Statement

All students requesting reasonable accommodation must meet with the instructor prior to or during the first week of the course to review all proposed accommodations in relation to course content and requirements. Please note that written evaluations can be accommodated but performance evaluations are considered analogous to job skill performance, therefore expectations will not be adjusted.

Reasonable accommodations are available for students with a documented disability. If you have a disability and may need accommodations to fully participate in this class, please contact Liz West, Assistant Director of Student Affairs, in Academic Center 130 (liz.west@wsu.edu, 509-358-7534). Read more: <http://spokane.wsu.edu/students/current/StudentAffairs/disability/disabilityguidelines.html>

Campus Safety

The WSU Campus Safety Plan, which can be found at <http://safetyplan.wsu.edu>, contains a comprehensive listing of university policies, procedures, statistics, and information relating to campus safety, emergency management, and the health and welfare of the campus community. Please visit this web site as well as the University emergency management web site at <http://oem.wsu.edu/Emergencies> to become familiar with the campus safety and emergency information provided. Everyone should also become familiar with the WSU ALERT site (<http://alert.wsu.edu>) where information about emergencies and other issues affecting WSU will be found. This site also provides information on the communication resources WSU will use to provide warning and notification during emergencies. It should be bookmarked on computers. **Finally, all faculty, staff, and students should go to the zzusis portal at <http://mywsu.wsu.edu> and register their emergency contact information for the Crisis Communication System (CCS).** Enter your network ID and password and you will be taken to the mywsu portal page. Look for the Pullman Emergency Information box on the left side of the page and click on Update Now to be taken to the registration page where you can enter your cell, landline, and email contact information as well as arrange for emergency text messages to be sent to your cell phone.

From: [Evans, Marc Alexander](#)
To: [Lambeth, Suzanne Terese](#)
Cc: [WSU.Curriculum](#)
Subject: FW: 076 Catalog Subcommittee Review of PharmSci 577 and 560 (agenda items 76 and 77)
Date: Thursday, October 29, 2015 10:52:56 AM

Hi Suzanne:

I only moments ago recalled that you wanted to know about the cross-listing of PharmSci/NEP 577. As you can see from Kay Meier's email below, the cross-listing is to be dropped. At today's meeting we can discuss the possible conflict of the PharmSci courses with Todd's courses, though I don't think there is too much of an issue.

Marc

From: Meier, Kathryn
Sent: Thursday, October 29, 2015 10:48 AM
To: Evans, Marc Alexander
Subject: Re: Catalog Subcommittee Review of PharmSci 577 and 560 (agenda items 76 and 77)

Thanks for catching this. The cross-listing should be dropped.

--Kay

Sent from my BlackBerry 10 smartphone.

From: Evans, Marc Alexander
Sent: Thursday, October 29, 2015 10:40 AM
To: Meier, Kathryn
Subject: RE: Catalog Subcommittee Review of PharmSci 577 and 560 (agenda items 76 and 77)

Hi Kay:

Quick question for you concerning PharmSci 577. The original course was cross-listed with NEP. However, the major curricular change form did not mention that the course is cross-listed. So, is Pharmacy Science wanting this cross-listing to continue or is the cross-listing to be dropped?

Thanks, Marc

From: Meier, Kathryn
Sent: Tuesday, October 13, 2015 7:03 PM
To: Evans, Marc Alexander
Cc: Daoud, Sayed Salih
Subject: RE: Catalog Subcommittee Review of PharmSci 577 and 560 (agenda items 76 and 77)

Hi Marc:

I have attached the edited version of PharmSci 577.

Thanks very much,
Kay Meier

From: Evans, Marc Alexander
Sent: Thursday, October 08, 2015 10:24 AM
To: Meier, Kathryn
Subject: RE: Catalog Subcommittee Review of PharmSci 577 and 560 (agenda items 76 and 77)

Hi Kay:

No worries. I'm not sure that we would get to them at this week's meeting. Next week is more likely.

Cheers, Marc

From: Meier, Kathryn
Sent: Thursday, October 08, 2015 10:09 AM
To: Evans, Marc Alexander
Subject: Re: Catalog Subcommittee Review of PharmSci 577 and 560 (agenda items 76 and 77)

Dr. Daoud is out of town, so we may not have the 577 edits to you until next week.

Sent from my BlackBerry 10 smartphone.

From: Evans, Marc Alexander
Sent: Thursday, October 8, 2015 9:44 AM
To: Meier, Kathryn
Subject: RE: Catalog Subcommittee Review of PharmSci 577 and 560 (agenda items 76 and 77)

Hi Kay:

I picked up another issue with the PharmSci 577 syllabus that you send on Thursday of last week. The course lists a 15 week schedule, but week 14 is listed as Thanksgiving. So, the proposed course only has 14 weeks in the schedule. Can you please fill in week 14 with course content. Also, I assume that you won't be having a final exam for the course based on the schedule. Is this a correct assumption? Once you have made the changes to the syllabus, would you please send me an electronic copy.

Regards, Marc

From: Meier, Kathryn
Sent: Thursday, October 01, 2015 11:58 AM
To: Evans, Marc Alexander
Cc: Wang, Shuwen; Daoud, Sayed Salih
Subject: Re: Catalog Subcommittee Review of PharmSci 577 and 560 (agenda items 76 and 77)

Marc:

Thank you for your review and feedback. Edited versions of the two syllabi are attached.

--Kay Meier

From: <Evans>, Marc Alexander <marcevan@wsu.edu>

Date: Thursday, October 1, 2015 10:53 AM

To: Kathryn Meier <kmeier@wsu.edu>

Subject: Catalog Subcommittee Review of PharmSci 577 and 560 (agenda items 76 and 77)

Hi Kay:

The catalog subcommittee is also reviewing the proposed changes to PharmSci 577 and the proposed new course PharmSci 560. Both of these courses appear to be in good order, except for the small issue that was indicated in my previous email concerning PharmSci 540; the grading system for both courses have gaps which we would like corrected. If you would please make the appropriate changes to the grading systems and send me an updated electronic version of each syllabus I would be most appreciative.

Regards, Marc

Marc Evans

Professor of Statistics

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