

MEMORANDUM

TO: Howard Grimes, Dean
Graduate School

FROM: Sinisa Mesarovic, Associate Professor
Chair, Graduate Studies Committee 

DATE: April 22, 2009

RE: **Graduate Certificate in Nuclear Engineering**

Attached is our proposed Graduate Certificate in Nuclear Engineering. This has been approved by both the faculty and Graduate Studies Committee. We would appreciate your office approving it and then forwarding it to the University's Graduate Studies Committee for review.

If you have any questions about it, please let me know. Thank you.

Mbs
Attachment

GRADUATE CERTIFICATE PROGRAM IN NUCLEAR ENGINEERING

School of Mechanical and Materials Engineering

1. Statement of Need

The nuclear industry has a strong presence in eastern Washington and will continue to grow as our nation strives to meet energy needs. The regional center for nuclear industry employment is in the TriCities region the site of the Hanford Nuclear Reservation, the Columbia Generating Station (currently the only operating commercial plant in the northwest), the largest nuclear waste treatment project in the nation, and the Pacific Northwest National Laboratory (a multiprogram laboratory of the DOE). There are also nuclear fuels (Areva) and nuclear medical isotope (IsoRay) businesses nearby. WSU Pullman operates the Nuclear Radiation Center which is one of a few remaining university research reactors in the nation.

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 formal training is in a non nuclear discipline. Statistics show that only a small portion of engineers employed in the nuclear industry, ~5%, have a nuclear engineering degree. Thus this approach supplies the needs and expectation of the current and future industry.

2. Admission Requirements

A prospective student must have received a baccalaureate degree from a college or university accredited by a recognized accrediting association. The applicant must apply and be admitted to graduate school, fulfilling all the requirements and standards of regular students.

Students will be admitted as a "Not-Advanced-Degree-Candidate" (NADC), as defined by the Graduate School, and may only accumulate nine credits.

3. Statement of Resources

The Graduate Certificate Program in Nuclear Engineering primarily draws upon the existing resources of the School of Mechanical and Materials Engineering. The participating faculty members hold appointments in the School of Mechanical and Materials Engineering and Chemistry.

We expect this program to be desirable to traditional students; as well as, those who are working professionals in the region's nuclear industries. Each semester there will be at least one course offering from the graduate certificate program available on the AMS system and/or on streaming video. Courses will be offered late in the day or evening to accommodate working engineers.

4. Description of Curriculum

This course offerings of the graduate certificate program will address the following key components:

- Fundamental nuclear engineering
- Reactor engineering
- Safety
- Waste management

To obtain the certificate, students must complete a minimum of nine credits from the following list of courses, six of which must be at the graduate level. Courses taken under the graduate certificate program will be graded. No S/F courses will be used or counted for the certificate. Courses in which a grade of B- or less is obtained may not count towards completion of the requirements. All academic standards will conform to Graduate School policy.

To receive the certificate, students must submit an *Application for Graduation for Graduate Certificate* with the appropriate signatures, pay a fee, and submit it to the Graduate School when the certificate coursework has been completed.

- **ME 461 Introduction to Nuclear Engineering 3.** A broad introduction: applied nuclear physics, application to the nuclear fuel cycle and reactor core design, systems and safety.
- **ME 460 Nuclear Reactor Engineering 3** Nuclear reactor design problems in thermodynamics, fluid flow, heat transfer, fuel preparation, waste disposal, materials selection; nuclear reactor systems and safety.
- **ME 483 Special Topics in Mechanical Engineering: Nuclear Safeguards and Security 3** The design, implementation, and oversight of effective nuclear material safeguards, security and response systems.
- **ME 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.
- **Chem 550 Special Topics in Nuclear Processes and Radioactive Waste Management V 1-3** May be repeated for credit. Prereq permission of instructor. Fundamental chemistry of the nuclear industry, chemical processing and waste management.
- **ME 579: Special Topics in Mechanical Engineering: Nuclear Reactor Engineering 3** Reactor power distribution, thermal and exposure limits, critical heat flux and pressure design, neutronic/thermal hydraulic relationships, transient accident analysis.

Contact person:

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