THE NUCLEAR ENGINEERING GRADUATE PROGRAM

The Department of Mechanical Engineering and Materials Science offers graduate studies in nuclear engineering. Broad areas covered in the curriculum include: (1) Nuclear Energy Technology (2) Nuclear Operations and Safety (3) Nuclear Materials (4) Nuclear Modeling and Simulations and (5) Radiochemistry and Radiation Measurement.

DEGREE PROGRAMS

Master of Science Program

The degree requirements can be met by either of the two options described below. Upon entering, the student plans a program of study with the aid of a faculty advisor.

Thesis Option (Research M.S. Track)

The research M.S. track is primarily for those students focused on technology development. Further, full time graduate students who are supported by department scholarships must choose the research M.S. track. The thesis examining committee will consist of at least three members of the faculty recommended by a major advisor and approved by the MEMS department chair. The final oral examination in defense of the master's thesis is conducted by the thesis committee, and a report of this examination signed by all members of the committee must be filed in the office of the dean.

Requirements

To complete the MS requirement of 30 graduate credits (with at least a 3.00 QPA) for the Research M.S., students must complete:

- ME 2997 (MS Research, totaling 3-credits)
- ME 2999 (MS Thesis, totaling 6-credits)
- 21 additional credits, comprising:
  - At least one of the following three mathematics courses (3-credits each)
    - ME 2001 (Differential Equations),
    - ME 2002 (Linear and Complex Analysis) or
    - ME / ECE 2646 (Linear System Theory).
  - At least five of the nuclear engineering courses listed below (totaling at least 15 credits)
  - Up to nine graduate credits (six for MS/MBA students) from courses offered in other engineering departments or in the mathematics or physics departments (totaling up to 9-credits), as approved by the Nuclear Engineering program directors.
Non-Thesis Option (Professional M.S. Track)

The professional MS program is oriented toward full-time students seeking a career in industry, and part-time students currently working in industry. Full-time Grad Student Research-supported students might change to the Professional M.S. track, upon approval by the sponsoring faculty advisor and the graduate program.

The professional master's degree requires the completion of at least 30 course credits of graduate study approved by the Nuclear Engineering program directors, with at least a 3.00 QPA. No more than six credit hours may be granted as transfer credit for work done at another accredited graduate institution. All credits earned in the ME master's degree program must be at the graduate level (the 2000 or 3000 series courses).

Requirements

To complete the MS requirement of 30 graduate credits for the Professional M.S., students must complete:

- At least one of the following three mathematics courses (3-credits each)
  - ME 2001 (Differential Equations),
  - ME 2002 (Linear and Complex Analysis) or
  - ME / ECE 2646 (Linear System Theory).
- At least five of the nuclear engineering courses listed below (totaling at least 15 credits)
- Up to nine graduate credits (six for MS/MBA students) from courses offered in other engineering departments or in the mathematics or physics departments (totaling up to 9-credits) as approved by Nuclear Engineering program directors.

MS/MBA students are also required to complete an integrated project course. Please contact the Graduate Directors for a copy of the guidelines for the integrated project course.

Nuclear Engineering course offerings vary by semester, and include:

ME 2100 Fundamentals of Nuclear Engineering
ME 2101 Nuclear Core Dynamics
ME 2102 Nuclear Plant Dynamics and Control
ME 2103 Integration of Nuclear Plant Systems with the Reactor Core
ME 2104 Nuclear Operations and Safety
ME 2105 Integrated Nuclear Power Plant Operations
ME 2106 Nuclear Quality Assurance Management
ME 2110 Nuclear Materials
ME 2112 Nuclear Chemistry and Radiochemistry
ME 2113 Radiation Detection and Measurement
ME 2115 Heat Transfer & Fluid Flow In Nuclear Plants
ME 2116 Boiling Water Reactor Thermal Hydraulics and Safety
ME 2120 Mathematical Modeling of Nuclear Plants
ME 2122 Management Principles in Nuclear Power
ME 2125 Case Studies in Nuclear Codes and Standards
ME 2130 The Nuclear Fuel Cycle
ME 2097 Special Study (as agreed with Advisor)
Graduate Certificate in Nuclear Engineering

Overview
A key need in the nuclear technology marketplace is for engineers from diverse disciplines who possess knowledge of nuclear phenomenology and technology. The University of Pittsburgh meets these marketplace needs by preparing engineers through the graduate certificate in nuclear engineering.

Objective
The objective of the nuclear engineering certificate is to provide the advanced competencies needed by science and engineering graduates to contribute quickly and effectively to nuclear science and technology in the United States and abroad.

This program provides coursework for graduate level nuclear engineering education with a focus on nuclear operations and safety. The certificate may be combined with graduate courses in any one of the seven MS degree programs (Bioengineering, Chemical, Civil, Electrical and Computer, Industrial, Materials Science and Mechanical Engineering) or taken as a post-baccalaureate certificate. The focus on nuclear operations and safety not only fulfills a recognized educational need, but also takes advantage of unique industrial resources in the Pittsburgh area which greatly facilitate student learning.

Since all nuclear courses are cross-listed as Mechanical Engineering Courses, they count both toward a Nuclear Certificate and toward an MS or PhD degree.

Requirements
All students must successfully complete five of the nuclear courses listed above in order to earn the graduate certificate. Nuclear Certificates are conferred only on those students who have completed all course requirements with at least a 3.00 GPA.

Contacts
If you have questions about the curriculum, please contact either the Director or Associate Director of Nuclear Engineering. Currently these posts are occupied by Dr. Heng Ban (heng.ban @ pitt.edu) and Dr. Tom Congedo (tvc9@pitt.edu), respectively.

If you have questions about registration, please contact the Graduate Administrator, Ms. Carolyn Chuha (eac90@pitt.edu) or (412) 624-9722