NUCLEAR, PLASMA & RADIOLOGICAL ENGINEERING, MS

for the degree of Master of Science in Nuclear, Plasma & Radiological Engineering

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For full consideration of fall admission with financial aid, application receipt deadline is January 1st. Students who wish to enter in the spring term should contact the Department before applying.

All applicants, regardless of US citizenship, whose native language is not English and who wish to be considered for teaching assistantships must demonstrate spoken English language proficiency (http://grad.illinois.edu/admissions/taengprof.htm) by achieving a minimum score of 24 on the speaking subsection of the TOEFL iBT or 8 on the speaking subsection of the IELTS. For students who are unable to take the iBT or IELTS, a minimum score of 4CP is required on the EPI test (http://cte.illinois.edu/testing/oral_eng/epe_overview.html), offered on campus. All new teaching assistants are required to participate in the Graduate Academy for College Teaching (https://citl.illinois.edu/citl-101/teaching-learning/grad-academy-for-college-teaching) conducted prior to the start of the semester.

Department Research

The Faculty of the Department of Nuclear, Plasma & Radiological Engineering are internationally recognized experts in the areas of: nuclear science and engineering, radiation processes and transport, materials science, thermal sciences, systems engineering, energy conversion processes and systems, plasma sciences and processing, fusion energy, radiation-based medical imaging and therapy, dosimetry and radiation protection, radiation detection analysis, reliability and risk analysis, energy systems, and international security. Graduate students in the Department are active participants and contributors to these areas of education and research and typically pursue careers in one of these areas. Graduate students in the Department are also encouraged to take part in course work and research activities in other engineering and science departments to complement their professional development in the nuclear engineering field. Faculty in other related fields are available to supervise research for students through formal “affiliate faculty” appointments. For a detailed list of current research interests of the faculty, visit the department’s research web site (https://npre.illinois.edu/research/facilities).

A wide range of major research resources are available for nuclear engineering research. These are described at the department’s research facilities website (https://npre.illinois.edu/research/facilities).

Other Graduate Programs in the Department of Nuclear, Plasma & Radiological Engineering

degrees:
- Nuclear, Plasma, & Radiological Engineering, PhD (http://catalog.illinois.edu/graduate/engineering/nuclear-plasma-radiological-engineering-phd)

optional concentrations:
- Computational Science & Engineering (http://catalog.illinois.edu/graduate/engineering/concentration/computational-science-engineering)

Concentrations:
The Department of Nuclear, Plasma & Radiological Engineering (NPRE) offers programs leading to degrees of Master of Science and Doctor of Philosophy in Nuclear, Plasma & Radiological Engineering, as well as Master of Engineering in Engineering with a Concentration in Energy Systems or a Concentration in Plasma Engineering. The Master of Science and Doctor of Philosophy degree programs are centered around three theme areas:

- nuclear power engineering
- fusion and plasma science and engineering
- radiological engineering and medical physics

Advanced course work and active research programs are offered in all of these areas.

Opportunity also exists for specializing in energy and sustainability engineering via the

**Energy and Sustainability Engineering (EaSE) Graduate Certificate Option**

_for the degree of Master of Science in Nuclear, Plasma & Radiological Engineering_

The M.S. degree takes at least two semesters and a summer session to complete and normally takes three semesters and a summer session. The curriculum requires courses covering the fundamentals of nuclear engineering and radiation interaction with matter, plus two or more courses in an area of concentration chosen by the student in consultation with an advisor. Typical areas are:

- fission engineering including reactor physics and radiation transport
- reactor analysis, thermal hydraulics, and reactor safety
- fuel cycles, radiation effects, and radioactive waste management
- fusion engineering and technology
- plasma engineering and processing
- nuclear materials, corrosion, and irradiation damage
- neutron scattering
- nuclear nonproliferation and public policy issues
- radiation detector development and homeland security applications
- biomedical imaging, MRI applications, radiation protection, radiation-based therapy, and health physics
- reliability and risk analysis and probabilistic risk assessment
- computational methods including Lie Group, integral-differential equation, Monte Carlo, big data and fuzzy logic applications.

For additional details and requirements refer to the department's printed handbook and the Graduate College Handbook.