NUCLEAR ENGINEERING SCIENCES

Graduate Coordinator: D. Schubring

Housed within the Herbert Wertheim College of Engineering's Department of Materials Science & Engineering, this program offers students an opportunity to work on research teams related to backscatter radiation, extreme environment testing and nuclear fuel cycles. Students also conduct research alongside academics and in partnership with national labs and government agencies, including Idaho National Laboratory and the U.S. Department of Energy. At UF, we're developing the next generation of nuclear engineering leaders by performing high-impact research and providing exceptional educational programs. Please contact the Department of Materials Science & Engineering for more information about this program.

Degrees Offered

Degrees Offered with a Major in Nuclear Engineering Sciences

- Doctor of Philosophy
  - without a concentration
  - concentration in Imaging Science and Technology
- Master of Engineering
- Master of Science

Requirements for these degrees are given in the Graduate Degrees (http://gradcatalog.ufl.edu/graduate/degrees/) section of this catalog.

Courses

Nuclear Engineering Sciences Program Courses

Code	Title	Credits
ENU 5142	Reliability and Risk Analysis for Nuclear Facilities	3
ENU 5176L	Principles of Nuclear Reactor Operations Laboratory	1
ENU 5186	Nuclear Fuel Cycles	3
ENU 5196	Nuclear Reactor Power Plant System Dynamics and Control	3
ENU 5516L	Nuclear Engineering Laboratory II	2
ENU 5615C	Nuclear Radiation Detection and Instrumentation	4
ENU 5626	Radiation Biology	3
ENU 5658	Imaging System Analysis with Medical Physics Applications	3
ENU 6051	Radiation Interaction Basics and Applications I	3
ENU 6052	Radiation Transport Basics and Applications	3
ENU 6061	Survey of Medical Radiological Physics	1
ENU 6106	Nuclear Reactor Analysis I	3
ENU 6126	Fundamentals of Reactor Kinetics	3
ENU 6135	Nuclear Thermal Hydraulics	4
ENU 6136	Advanced Nuclear Thermal Hydraulics	3
ENU 6623	Radiation Dosimetry	3
ENU 6627	Therapeutic Radiological Physics	3
ENU 6636	Medical Radiation Shielding & Protection	3
ENU 6651	Clinical Rotation in Radiation Therapy	3
ENU 6652	Clinical Rotation in Diagnostic Radiology	3
ENU 6655	Advanced Diagnostic Radiological Physics	3
ENU 6657	Diagnostic Radiological Physics	3
ENU 6659	Nuclear Medicine Instrumentation and Procedure	3
ENU 6835	Nuclear Fuels	3
ENU 6905	Individual Work	1-6
ENU 6910	Supervised Research	1-5
ENU 6935	Nuclear and Radiological Engineering Seminar	1
ENU 6936	Special Projects in Nuclear and Radiological Engineering Sciences	1-9
ENU 6937	Special Topics in Nuclear and Radiological Engineering Sciences	1-9
ENU 6971	Research for Master's Thesis	1-15
ENU 6972	Research for Engineer's Thesis	1-15
ENU 7979	Advanced Research	1-12
ENU 7980	Research for Doctoral Dissertation	1-15

Nuclear Engineering Sciences Departmental Courses

Code	Title	Credits
EGN 6913	Engineering Graduate Research	0-3
ENU 5005	Introduction to Nuclear Engineering	4
ENU 5142	Reliability and Risk Analysis for Nuclear Facilities	3
ENU 5176L	Principles of Nuclear Reactor Operations Laboratory	1
ENU 5186	Nuclear Fuel Cycles	3
ENU 5196	Nuclear Reactor Power Plant System Dynamics and Control	3
ENU 5516L	Nuclear Engineering Laboratory II	2
ENU 5615C	Nuclear Radiation Detection and Instrumentation	4
ENU 6051	Radiation Interaction Basics and Applications I	3
ENU 6052	Radiation Transport Basics and Applications	3
ENU 6061	Survey of Medical Radiological Physics	1
ENU 6106	Nuclear Reactor Analysis I	3
ENU 6126	Fundamentals of Reactor Kinetics	3
ENU 6135	Nuclear Thermal Hydraulics	4
ENU 6136	Advanced Nuclear Thermal Hydraulics	3
ENU 6305	Radiochemistry	3
ENU 6627	Therapeutic Radiological Physics	3
ENU 6651	Clinical Rotation in Radiation Therapy	3
ENU 6655	Advanced Diagnostic Radiological Physics	3
ENU 6715	Plasma and Fusion	3
ENU 6835	Nuclear Fuels	3
ENU 6905	Individual Work	1-6
ENU 6910	Supervised Research	1-5
ENU 6935	Nuclear and Radiological Engineering Seminar	1
ENU 6936	Special Projects in Nuclear and Radiological Engineering Sciences	1-9
ENU 6937	Special Topics in Nuclear and Radiological Engineering Sciences	1-9
ENU 6940	Supervised Teaching	2
ENU 6941	Professional Development for Nuclear Engineering Sciences	1
ENU 6971	Research for Master's Thesis	1-15

ENU 6972	Research for Engineer's Thesis	1-15
ENU 7979	Advanced Research	1-12
ENU 7980	Research for Doctoral Dissertation	1-15

College of Engineering Courses

Code	Title	Credits
EEE 5354L	Semiconductor Device Fabrication Laboratory	3
EGN 5010L	NRF Training Lab	1
EGN 5949	Practicum/Internship/Cooperative Work Experience	1-6
EGN 6640	Entrepreneurship for Engineers	3
EGN 6642	Engineering Innovation	3
EGN 6913	Engineering Graduate Research	0-3
EGN 6933	Special Topics	1-3
EGN 6937	Engineering Fellowship Preparation	0-1
EGS 6039	Engineering Leadership	3
EGS 6101	Divergent Thinking	3
EGS 6626	Fundamentals of Engineering Project Management	3
EGS 6628	Advanced Practices in Engineering Project Management	3
EGS 6681	Advanced Engineering Leadership	3
EMA 6581	Polymeric Biomaterials	3
ESI 6900	Principles of Engineering Practice	1-4

Student Learning Outcomes

Nuclear engineering sciences (PHD)

SLO 1 Knowledge
Identify unknown aspects of nuclear and/or radiological systems and formulate an approach to elucidating those aspects using engineering and/or scientific principles at a level appropriate to a doctoral research.

SLO 2 Knowledge
Demonstrate proficiency on appropriate experimental or computational techniques used for nuclear engineering research, and use these techniques to investigate various relationships (atomic, nuclear, mechanical, materials performance, etc.) in nuclear systems at a level appropriate to doctoral research.

SLO 3 Skills
Obtain information from primary literature and technical reports, and integrate that information to reach conclusions regarding the current state-of-the-art and areas in which further research is needed.

SLO 4 Skills
Write and/or orally present the results of a research project or literature review in a manner that clearly communicates one or more of the following: current state-of-the-art, areas in which additional research is needed, research objectives, procedures, results, and conclusions.

SLO 5 Professional Behavior
Follow requirements for writing reports and research papers, and do so based on ethical standards regarding appropriate citation and plagiarism.

SLO 6 Professional Behavior
Work cooperatively with others, interact with supervisors, follow guidelines for appropriate management of data, and follow safety requirements for working in a research laboratory

Nuclear Engineering Sciences (Me & Ms)

SLO 1 Knowledge
Identify unknown aspects of nuclear and/or radiological systems and formulate an approach to elucidating those aspects using engineering and/or scientific principles at a level appropriate to a Master of Science degree in nuclear engineering

SLO 2 Skills
Obtain information from primary literature and technical reports, and integrate that information to reach conclusions regarding the current state of the art and areas in which further research is needed

SLO 3 Skills
Write and/or orally present the results of a research project or literature review in a manner that clearly communicates one or more of the following: current state-of-the-art, areas in which additional research is needed, research objectives, procedures, results, and conclusions

SLO 4 Professional Behavior
Follow requirements for writing reports and research papers, and does so based on ethical standards regarding appropriate citation and plagiarism