

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	Risk Assessment and Economic Analysis of Nuclear Systems.	3
ENU 5176L	Principles of Nuclear Reactor Operations Laboratory	1
ENU 5186	Nuclear Fuel Cycles	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 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 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	Risk Assessment and Economic Analysis of Nuclear Systems.	3
ENU 5176L	Principles of Nuclear Reactor Operations Laboratory	1
ENU 5186	Nuclear Fuel Cycles	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 6106	Nuclear Reactor Analysis I	3
ENU 6115	Power Plant Simulation	3
ENU 6126	Fundamentals of Reactor Kinetics	3
ENU 6135	Nuclear Thermal Hydraulics	4
ENU 6136	Advanced Nuclear Thermal Hydraulics	3
ENU 6143	Advanced Nuclear Reactor Concepts	3
ENU 6305	Radiochemistry	3
ENU 6375	Nuclear Security Science	3
ENU 6616C	Advanced Radiation Measurement Laboratory	3
ENU 6715	Plasma and Fusion	3
ENU 6835	Nuclear Fuels	3
ENU 6845L	Nuclear Fuels and Materials Laboratory	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
CAP 5771	Introduction to Data Science	3
EEE 5354L	Semiconductor Device Fabrication Laboratory	3
EEE 5776	Applied Machine Learning	3
EEE 6778	Applied Machine Learning II	3
EGN 5215	Machine Learning Applications in Civil Engineering	3
EGN 5216	Machine Learning for Artificial Intelligence Systems	3

EGN 5442	Programming for Applied Data Science	3	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
EGN 6216	Artificial Intelligence Systems	3	
EGN 6217	Applied Deep Learning	3	
EGN 6446	Mathematical Foundations for Applied Data Science	3	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
EGN 6640	Entrepreneurship for Engineers	3	
EGN 6642	Engineering Innovation	3	SLO 4 Professional Behavior Follow requirements for writing reports and research papers, and does so based on ethical standards regarding appropriate citation and plagiarism
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 6629	Agile Project Management for Engineers and Scientists	3	
EGS 6681	Advanced Engineering Leadership	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