

1 Getting Started

1.1 Welcome

The Faculty of Nuclear Science and Engineering prize cutting-edge education, high-impact research, and dedicated service to others. We believe that excellent programs in engineering education and research provide a framework to teach students problem solving, creative thinking, and critical analysis techniques. More than this, no matter the degree earned, or if a student strives to become a scientist, philosopher, or artist, engineering education and research are pathways to understanding the world around us, to developing an open mind, and to becoming a leader and innovator in any profession. We are thrilled that you have decided to join the Nuclear Engineering Program at the University of Florida and look forward to working together.

1.2 Mission

As materials scientists and nuclear engineers, we have a singular opportunity to provide a bridge across many disciplines and to bring talented people together to attack challenges from sending people to live in space, to providing clean and secure energy for the future, or to finding new ways to understand diseases and their eventual cures. As such, our vision is to make the Department of Materials Science and Engineering a place that will foster each generation of students and faculty to challenge themselves, to grow as thinkers and leaders, inspire others, and dream up new ways to contribute to human knowledge.

We provide the world at-large with innovative research and high quality scientists and engineers. Our mission is to be recognized as a top 10 program in both the Nuclear and Materials Science Engineering programs. To achieve this mission, together, we will grow the faculty, empower each member to excel in teaching, research, and service, further develop the infrastructure required to perform world-class research, and continue to embrace diversity and actively seek to increase it.

2 Contacts and Links

2.1 Key Personnel

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2.2 Useful Links

Nuclear Engineering Program
<http://www.nuceng.ufl.edu>
Department of Materials Science and Engineering
<http://www.mse.ufl.edu>
College of Engineering
<http://www.eng.ufl.edu>
2017 - 2018 Academic Calendar
<http://gradcatalog.ufl.edu/content.php?catoid=11&navoid=2421>
Fall 2017 Course Listing
<http://www.registrar.ufl.edu/soc/201508/all/nuclearr.htm>
Graduate School
<http://graduateschool.ufl.edu>

Courses and Credits

<http://gradcatalog.ufl.edu/content.php?catoid=2&navoid=762#courses>

Thesis and Dissertation Requirements

<http://graduateschool.ufl.edu/graduation/thesis-and-dissertation>

3 Doctor of Philosophy in Nuclear Engineering

The requirements for completing a Doctor of Philosophy in Nuclear Engineering include a minimum number of credit hours, nuclear core courses, three examinations, and a dissertation. Specific information on each requirement is detailed below.

3.1 Credit Hour Requirements

90 credit hours of course work are required to earn a Ph.D. Students with a master's degree in nuclear engineering or a related field from either the University of Florida or a different institution may transfer up to 30 hours from that degree into the program at the discretion of the Graduate School. Credit for nuclear engineering courses may be given at the discretion of the Graduate Program Coordinator.

- 21 of the 90 credit hours must be graded (A-E) lecture or lab courses with numbers 5000+ with any engineering, science, math, or statistics prefix.
- 15 of the 21 credit hours must be graded (A-E) lecture or lab courses with numbers 5000+ with the nuclear engineering (ENU) prefix.
- The remainder of the credits may be graded courses, courses used to fulfill the Professional Development Requirement research credits, including ENU 7979 (Advanced Research) and ENU 7980 (Doctoral Research). ENU 7979 is to be taken prior to achieving candidacy and ENU 7980 after. Passing the oral qualifying examination (dissertation proposal) marks the achievement of candidacy; see Section 3.6.

3.2 Core Courses

The following courses are the nuclear core course requirements and fulfill the 15 credit hour requirement as described above.

Course Number	Course Title	Semester Taught	Credit Hours
ENU 6051	Radiation Interaction 1	Fall	3
ENU 6106	Nuclear Reactor Analysis 1	Fall	3
ENU 6135	Nuclear Thermal Hydraulics	Fall	4
ENU 5615C	Radiation Detection	Spring	4
ENU 6805	Nuclear Materials	Spring	3

- Students who have completed ENU 4134 Reactor Thermal Hydraulics shall substitute ENU 6136 Advanced Nuclear Thermal Hydraulics or ENU 6937 (ENU 6143) Advanced

Nuclear Reactor Concepts as a core course, including for the purpose of the Written Qualifying Requirement. Students who completed the undergraduate version of ENU 6937 (ENU 6143) may petition to count EML 6155 Convection Heat Transfer instead, to avoid a one-year delay in completion of these requirements.

3.3 Professional Development Requirement

In addition to completion of their dissertation research, core courses, and credit hour requirements, students who entered the Ph.D. program in Fall 2017 or later are required to complete Professional Development activities equivalent to 6 credits (approximately 300 hours).

For all students, 1 of the 6 credits must be ENU 694y, Presentations and Pedagogy for Nuclear Engineering Sciences. This course is offered in Spring and must be taken in the student's first or second (usually first) spring in the Ph.D. program.

3.3.1 Supervised Teaching

Most students will complete the remaining 5 credits through assisting faculty with the teaching of nuclear engineering courses. The following options may be available to reach the minimum of 5 credits.

- 2 credits of ENU 6940, Supervised Teaching, may be earned by students acting as a Teaching Assistant for a lecture-based ENU course. Duties expected of lecture course TAs will include holding office hours and/or teaching selected lectures, at the discretion of the faculty member in charge of the course, as well as grading of coursework.
- 3 credits of ENU 6940, Supervised Teaching, may be earned by students acting as a Teaching Assistant for a laboratory ENU course. Duties expected of lab course TAs will primarily involve supervision of laboratory sections. Assigned duties may also include holding office hours and/or teaching selected lectures, at the discretion of the faculty member in charge of the course, as well as grading of coursework.

Only one of these options may be available in any given semester. In particular, assignment to laboratory vs. lecture-based courses will be based on the qualifications of the student (including undergraduate degree, UF coursework, and research performance/specialization), program needs, as well as the preference of the student. Some students may be assigned as a lab TA twice or as a lecture TA thrice, for a total of 6 credits. In this case, all 7 credits (6 from ENU 6940 and 1 from ENU 694y) will count towards their degree. (Students who are assigned as a lecture TA twice are encouraged to consider Student-Arranged Activities, as described below, in lieu of a third semester of lecture TA duty.)

Some Ph.D. students are interested in pursuing careers in engineering education, through faculty positions or other means. Students interested in this path may complete, in addition to one semester of either option above:

- 4 credits of ENU 694x, Advanced Pedagogy in Nuclear Engineering Sciences, which may be earned by students acting as a co-instructor for a lecture-based ENU course. Duties expected of a co-instructor are to hold the majority of lectures, to hold regular office hours, and to develop the majority of coursework (exams, projects, and homework) in collaboration with a faculty member who has previously taught the course.

Before selecting this option, students should consider their workload for the targeted semester, gain the approval of their advisor, and evaluate their own maturity relative to that expected of an instructor at the university level. Interested students are required to apply for this assignment; applications will be reviewed in light of the student's qualifications and the needs of the program. Students must have completed their written qualifying requirement prior to the semester in which they take ENU 694x. With rare exceptions, students must have completed their oral qualifying requirement prior to the semester in which they take ENU 694x and may not be enrolled in any lecture-based or laboratory courses in the semester in which they take ENU 694x.

For students who complete ENU 694x, all 7-8 credits (2-3 from ENU 6940, 4 from ENU 694x, and 1 from ENU 694y) will count towards their degree.

3.3.2 Student-Arranged Activities

Students who are not interested in teaching or who are legally prevented from teaching due to their source of funding (*e.g.*; some fellowships) may request a waiver of up to 5 credits of the professional development coursework requirement (ENU 6940 and ENU 694x) on the basis of completing other professional development activities. Waivers are not automatically granted on the basis of funding status alone. The onus to arrange these activities is on the *student*, not the program or the student's advisor.

Examples of such activities include:

- Completion of internships at national laboratories or in industry. Typically, a full-time summer internship will be taken as the equivalent of up to 2 credits, with a full-time, fall or spring semester internship as the equivalent of up to 3 credits. In general, completion of 2 summer internships will not, alone, be sufficient to meet the 5 required credits. However, students who have fellowships that require 2 such internships/practica and which forbid the student from teaching should petition to have the final credit waived.
- Regional, national, or international leadership positions in professional societies or conferences, such as ANS Student Director. As a guideline, 1 credit of waiver will be offered per 50 hours of student effort. Waivers are not available for leadership positions within UF.
- Completion of UF coursework relevant to professional development. Such courses could include advanced technical writing or oral presentations courses (particularly for students whose first language is not English), foreign language study, and/or completion of the FIDEF (Florida Institute for Development of Engineering Faculty) courses.

Students should be aware that the number of credits of the professional development requirement waived will be at the discretion of the program and, particularly for foreign language study, may be fewer than the number of course credits.

Waivers for other professional development activities, including those completed prior to enrollment in the Ph.D. program, may be requested, such as time spent in industry, national laboratories or other research, military service, or teaching. Approval for all professional development activities other than supervised teaching is at the discretion of the NE Program Director, in consultation with the NE Graduate Coordinator, the student's advisor, and the NE faculty. Approval will be based primarily on the professional development needs of the student, but may also consider the NE program's need for Teaching Assistants.

3.4 Supervisory Committee

Students must select a committee with a chair, who has graduate faculty status in nuclear engineering; at least two other members, who have graduate faculty status in nuclear engineering; and one external member, who has graduate faculty at the University of Florida but *not* in nuclear engineering. The supervisory committee must be formed by submitting the Appointment of Supervisory Committee Form, linked via:

<http://www.mse.ufl.edu/onpremforms/>

This must be done by the end of the second semester OR once the student has completed 12 credit hours of work.

3.5 Written Qualifying Requirement

The written qualifying requirement is comprised of successful completion of course work; students must earn a minimum of a B in 4 of the 5 Nuclear Engineering Core Graduate courses to fulfill this requirement. Students must achieve the required marks by the end of their second year in the program. Additionally, students must have completed the written qualifying requirement before the oral qualifying exam is held. In their first semester of UF enrollment, students who transfer into the graduate program should talk to their advisor and graduate program coordinator regarding their academic record for completion of this requirement.

3.6 Oral Qualifying Examination

3.6.1 First Attempt

Students must pass the written exam before attempting the oral exam. Additionally, students must make the first attempt no later than the second summer after their admission, i.e. students admitted during Fall 2015 must make the first attempt no later than Summer 2017.

3.6.2 Exam Format

During the oral qualifying exam, the student will present the proposed dissertation research including (1) a review of the relevant research literature and (2) progress made and future plans for completing the proposed dissertation research.

3.6.3 Dissertation Proposal

In conjunction with the oral exam, the student should prepare a document serving as the dissertation research proposal and distribute to the supervisory committee at five days prior to the oral exam. The student's advisor must approve the proposal format. Additionally, students are required to submit the Admission to Candidacy Form, linked via:

<http://www.mse.ufl.edu/onpremforms/>

at least five business days prior to the scheduled exam.

3.6.4 Exam Administration

The student's advisor must approve the student attempting the exam. The student's supervisory committee will administer the oral exam, and all members must be present.

3.6.5 Exam Scoring

The supervisory committee will evaluate the student's proficiency in the proposed research area and the potential to complete the proposed research project successfully. The committee may recommend changes to the project scope, require additional course work, or make recommendations for techniques or collaborations that may expedite the research effort. The supervisory committee will deliver a Pass or Fail evaluation at the end of the oral exam.

3.6.6 Maximum Attempt Limit

A student that does not pass on their first attempt will be allowed a second attempt at the oral qualifying exam. The retake must be taken during the semester following the first attempt. A student who does not pass after the second attempt will not be allowed to continue in the Ph.D. program. In very limited and unusual circumstances students may request to delay the first or second attempt or may be allowed to attempt the oral qualifying exam a third time. Requests in extenuating circumstances must be made through the Graduate Program Coordinator to the Graduate Petition committee. Students should make every effort to follow the required schedule as exceptions to this rule are extremely rare.

3.7 Final Oral Examination

Once a student has been admitted to candidacy, i.e. passed the oral qualifying exam, they must complete an original dissertation and present it to their committee.

3.7.1 First Attempt

Students may make their first attempt of the final exam no earlier than six months after passing their oral qualifying exam.

3.7.2 Exam Format

During the final exam, the student will present their dissertation research any further requirements for this presentation will be set by their advisor.

3.7.3 Dissertation

In conjunction with the final exam, the student should prepare a written document, i.e. their dissertation. This document should be prepared and formatted in accordance with graduate school requirements, linked via:

<http://graduateschool.ufl.edu/about-us/offices/editorial/thesis-and-dissertation/> and must be approved by their advisor and committee.

3.7.4 Exam Administration

The student's advisor must approve the student attempting the exam. The student's supervisory committee will administer the final exam. All committee members must be present.

3.7.5 Exam Scoring

The supervisory committee will evaluate the student's proficiency in research. The supervisory committee will deliver a Pass or Fail evaluation at the end of the final exam.

3.7.6 Maximum Attempt Limit

A student that does not pass on their first attempt will be allowed a second attempt at the final exam. The retake must be taken during the semester following the first attempt. A student who does not pass after the second attempt will not be allowed to continue in the Ph.D. program. In very limited and unusual circumstances students may request to delay the first or second attempt or may be allowed to attempt the written qualifying exam a third time. Requests in extenuating circumstances must be made through the Graduate Program Coordinator. Students should make every effort to follow the required schedule as exceptions to this rule are extremely rare.

3.8 Other Requirements

- Students must complete ENU 6935, Nuclear and Radiological Engineering Seminar, 1 credit, prior to the semester in which the student defends their dissertation
- Students are required to complete the following training:
 - EH&S (safety) via UF. In person UF_EHS_864_ILT or online UF_EHS_862_OLT.
 - EH&S (radiation safety) via UF. In person UF_EHS_831_ILT.
 - DOE's Data Management Training, via <http://ntc.doe.gov>

4 Master of Science (Non-Thesis) in Nuclear Engineering

The requirements for completing a Master of Science (Non-Thesis) in Nuclear Engineering include a minimum number of credit hours, nuclear core courses, and a final project report. Specific information on each requirement is detailed below.

4.1 Credit Hour Requirements

30 credit hours of course work are required to earn a M.S. Students with graduate work in nuclear engineering or a related field from a different institution may transfer up to 9 hours from that institution at the discretion of the Graduate School. Credit for nuclear engineering courses may be given at the discretion of the Graduate Program Coordinator. Students with graduate work in a different graduate program at the University of Florida may transfer up to 9 hours from that program at the discretion of the Graduate Program Coordinator.

- A minimum of 24 of the 30 credit hours must be graded (A-E) lecture or lab courses with numbers with any engineering, science, math, or statistics prefix. ENU 6905, 6910, 6936, and 6971 *may not* be used to meet this requirement.
 - A minimum of 18 of these 24 graded credit hours must be numbered 5000 or above.
 - The remainder of these 24 credits (*i.e.*; up to 6 may be non-ENU courses numbered 3000 or above. (No ENU courses with course numbers of 4999 or below may be used)
- 12 of the 30 credit hours must be graded (A-E) lecture or lab courses with numbers 5000+ with the nuclear engineering (ENU) prefix. ENU 6905, 6910, 6936, and 6971 *may not* be used to meet this requirement.
- 6 of the 30 credit hours may be research or individual work courses, including ENU 6905 (Individual Work – letter graded), ENU 6910 (Supervised Research – S/U graded), and ENU 6936 (Special Projects in Nuclear and Radiological Engineering Sciences – letter graded). ENU 6971 (Research for Master’s Thesis – S/U graded) *may not* be used for the M.S. non-thesis degree, nor may ENU 7979 (Advanced Research) and ENU 7980 (Doctoral Research).

Students should be advised that transitioning between the M.S. non-thesis and thesis programs may not be possible in the middle of their graduate studies. Even when allowed, not all credits may transfer to the new degree.

4.2 Core Courses

The following courses are the nuclear core course requirements for the M.S. degree. Students considering continuing their studies to earn a Doctor of Philosophy are encouraged to take the additional courses required for the Ph.D. core.

Course Number	Course Title	Semester Taught	Credit Hours
ENU 6051	Radiation Interaction 1	Fall	3
ENU 5615C	Radiation Detection	Spring	4

4.3 Supervisory Committee

Students must select an advisor who has graduate faculty status in nuclear engineering. The supervisory committee will consist of this advisor only and must be formed by submitting the Appointment of Supervisory Committee Form, linked via:

<http://www.mse.ufl.edu/onpremforms/>

This must be done by the end of the second semester OR once the student has completed 12 credit hours of work.

Students are urged to find an advisor interested in mentoring them towards a strong M.S. project. Students who are unable to find a willing mentor will default to having the graduate program coordinator, currently Dr. Schubring, as advisor. In this case, the graduate coordinator will evaluate the M.S. project selected and produced by the student.

4.4 Final Project Report

In conjunction with their course work, M.S. non-thesis students are required to produce an M.S. project report.

For students who identified a faculty member to serve as their mentor, this work will be a report supervised by that faculty member. Students will submit a written report of their work to their mentor, who will determine if the report is satisfactory. Students with a mentor should take ENU 6936 with that faculty member.

For students without a mentor, it is the *responsibility of the student* to propose an M.S. project for the approval of the Graduate Program Coordinator and to abide by the deadline set by the Graduate Program Coordinator for submission of the project (this deadline will be earlier than those set by the graduate school to allow time for technical review of the work). In this case the satisfactory/unsatisfactory determination will be made by the Graduate Program Coordinator. This project may be related to the student's coursework, but should not be a document prepared as part of the work for any particular course nor a trivial extension thereof.

The M.S. project should represent a *substantial* effort over and above completion of coursework. As a guideline, students should expect to spend not fewer than 300 hours (*i.e.*; a half-time effort over a semester or a quarter-time effort over an academic year) on their M.S. project and to produce a report of 15 pages or more. Exceptions to these guidelines may be approved at the discretion of the student's advisor (whether this is their identified mentor or the graduate program coordinator).

5 Master of Science (Thesis) in Nuclear Engineering

The requirements for completing a Master of Science in Nuclear Engineering include a minimum number of credit hours, nuclear core courses, and a final thesis exam. Specific information on each requirement is detailed below.

5.1 Credit Hour Requirements

30 credit hours of course work are required to earn a M.S. Students with graduate work in nuclear engineering or a related field from a different institution may transfer up to 9 hours from that institution at the discretion of the Graduate School. Credit for nuclear engineering courses may be given at the discretion of the Graduate Program Coordinator. Students with graduate work in a different graduate program at the University of Florida may transfer up to 9 hours from that program at the discretion of the Graduate Program Coordinator.

- A minimum of 24 of the 30 credit hours must be graded (A-E) lecture or lab courses with numbers with any engineering, science, math, or statistics prefix. ENU 6905, 6910, 6936, and 6971 *may not* be used to meet this requirement.
 - A minimum of 18 of these 24 graded credit hours must be numbered 5000 or above.
 - The remainder of these 24 credits (*i.e.*; up to 6 may be non-ENU courses numbered 3000 or above. (No ENU courses with course numbers of 4999 or below may be used)
- 12 of the 30 credit hours must be graded (A-E) lecture or lab courses with numbers 5000+ with the nuclear engineering (ENU) prefix. ENU 6905, 6910, 6936, and 6971 *may not* be used to meet this requirement.
- 6 of the 30 credit hours may be research or individual work courses, including ENU 6905 (Individual Work – letter graded), ENU 6910 (Supervised Research – S/U graded), and ENU 6971 (Research for Master’s Thesis – S/U graded). ENU 6936 (Special Projects in Nuclear and Radiological Engineering Sciences – letter graded) *may not* be used for the M.S. non-thesis degree, nor may ENU 7979 (Advanced Research) and ENU 7980 (Doctoral Research). Students in the M.S. thesis program typically take 6 credits of ENU 6971.

Students should be advised that transitioning between the M.S. non-thesis and thesis programs may not be possible in the middle of their graduate studies. Even when allowed, not all credits may transfer to the new degree.

5.2 Core Courses

The following courses are the nuclear core course requirements. Students considering continuing their studies to earn a Doctor of Philosophy are encouraged to take the additional courses required for the Ph.D. core.

Course Number	Course Title	Semester Taught	Credit Hours
ENU 6051	Radiation Interaction 1	Fall	3
ENU 5615C	Radiation Detection	Spring	4

5.3 Supervisory Committee

Students must select a committee with a chair, with graduate faculty status in nuclear; at least two other members, one with graduate faculty status in nuclear; and one external member, with graduate faculty status but *not* in nuclear. The supervisory committee must be formed by submitting the Appointment of Supervisory Committee Form, linked via:

<http://www.mse.ufl.edu/onpremforms/>

This must be done by the end of the second semester OR once the student has completed 12 credit hours of work.

5.4 Final Oral Examination

Once the student has completed his or her research, they must present this work to their committee. This is the final exam.

5.4.1 Exam Format

During the final exam, the student will present their thesis research; any further requirements for this presentation will be set by their advisor.

5.4.2 Thesis

In conjunction with the final exam, the student should prepare a written document, i.e. their thesis. This document should be prepared and formatted in accordance with graduate school requirements, linked via:

<http://graduateschool.ufl.edu/about-us/offices/editorial/thesis-and-dissertation/> and must be approved by their advisor and committee.

5.4.3 Exam Administration

The student's advisor must approve the student attempting the exam. The student's supervisory committee will administer the final exam. All committee members must be present.

5.4.4 Exam Scoring

The supervisory committee will evaluate the student's proficiency in research. The supervisory committee will deliver a Pass or Fail evaluation at the end of the final exam.

5.4.5 Maximum Attempt Limit

A student that does not pass on their first attempt will be allowed a second attempt at the final exam. The retake must be taken during the semester following the first attempt. A student who does not pass after the second attempt will not be allowed to continue in the M.S. program. In very limited and unusual circumstances students may request to delay the first or second attempt or may be allowed to attempt the written qualifying exam a third time. Requests in extenuating circumstances must be made through the Graduate Program Coordinator. Students should make every effort to follow the required schedule as exceptions to this rule are extremely rare.

6 Additional Procedures

6.1 Registration Procedure

Each semester students must register a hold will be placed on each student's account before they are allowed to register. In order to register, the student must consult with their advisor on courses to be taken. Students must fill out the Graduate Online Advising Form, linked via:

<http://www.mse.ufl.edu/onpremforms/>

before registering. Full time students must register for 9 credit hours each spring and fall semester and 6 credit hours in the summer semester. New students or students with out an advisor should see the Graduate Program Coordinator, Dr. Schubring, for advising.

6.2 Semesterly Performance Evaluation

Each student on a Graduate Research Assistantship must be evaluated on a semesterly basis by their advisor. Details of the evaluation form are sent to students each semester. Students will not be allowed to register until this form is complete.