

# DOCTOR OF PHILOSOPHY WITH A MAJOR IN NUCLEAR ENGINEERING

The Nuclear and Radiological Engineering and Medical Physics Program within the Woodruff School offers a Doctor of Philosophy degree. There is both a Nuclear Engineering option and a Medical Physics option for this degree. Students may also complete the Nuclear Enterprise Management specialization. The field of nuclear engineering focuses on topics related to radiation interactions with matter. Applications range from nuclear reactor design to fusion power to nuclear medicine.

All PhD programs must incorporate a standard set of Requirements for the Doctoral Degree.

The doctoral degree in Nuclear Engineering (NE) requires 42 semester hours of course work (on a letter-grade basis) beyond the bachelor's degree or its equivalent. The doctoral degree in NE also allows for a specialization in Nuclear Enterprise Management. Course grades must be C or higher to satisfy PhD degree requirements. Candidates for the Doctor of Philosophy degree must earn and maintain a graduate grade-point average of at least 3.3.

## Requirements

### Program of Study

A Ph.D. Program of Study form must be submitted for approval by your faculty advisor and the Woodruff School Graduate Committee before the end of your first semester of doctoral study.

Upon preliminary approval, the Ph.D. Program of Study will be forwarded to the Woodruff School Graduate Committee for final approval. In preparing your program of study, students should be aware that graduate courses are usually offered only once a year and, in some cases, even less frequently.

Code	Title	Credit Hours
Major Area <sup>1</sup>		24
Minor Area <sup>2</sup>		9
Electives <sup>3</sup>		9
<b>Total Credit Hours</b>		<b>42</b>

<sup>1</sup> Must be in a coherent subject area appropriate to NE/RE. If completed a master's thesis in this area, it may count for nine semester hours toward this requirement.

<sup>2</sup> Must be distinctly different from the major area. The minor is intended to provide depth in an area not directly needed for Ph.D. research or related to the principal area of expertise.

<sup>3</sup> No restrictions.

### Nuclear Engineering/Medical Physics

The doctoral degree requires 52 semester hours of course work (on a letter-grade basis) beyond the bachelor's degree or its equivalent. A total of 46 semester hours must be at the 6000 level or above. Up to six semester hours may be at the 4000 level. Any courses required for the B.S.M.E. or the B.S.N.R.E **do not** meet these respective course requirements.

Code	Title	Credit Hours
Major Area <sup>1</sup>		34
Minor Area <sup>2</sup>		9
Electives/Other <sup>3</sup>		9
<b>Total Credit Hours</b>		<b>52</b>

<sup>1</sup> Must be in a coherent subject area appropriate to NE/RE. If you completed a master's thesis in this area, it may count for nine semester hours toward this requirement.

<sup>2</sup> Must be distinctly different from the major area. The minor is intended to provide depth in an area not directly needed for Ph.D. research or related to the principal area of expertise.

<sup>3</sup> May be different than the major or minor, or could be applied to the major or minor area.

### Qualifying Exam Grade Point Average Requirement

Must be registered for the semester in which you take the Ph.D. Qualifying Examination and have full graduate standing. A minimum GPA of 3.3 is required to take the qualifying examination.

### Examination Schedule

If a student already has a master's degree and matriculate as a Ph.D. student, the student must take the Ph.D. Qualifying Examination within the first year of your initial enrollment date in the Woodruff School graduate program. Those who matriculate with a bachelor's degree must take the qualifying examination within the two-year period of your initial enrollment date in the Woodruff School graduate program.

For example, if enrollment were Fall 2019, a student with master's degree and matriculated as a Ph.D. student should have taken the qualifying exams by Spring 2020. If enrollment were Spring 2020, exam would be taken by Fall 2020.

For example, if enrollment were Fall 2019, a student with bachelor's degree and matriculated as a Ph.D. student should have taken the qualifying exams Spring 2021. If enrollment were Spring 2020, exam would be taken by Fall 2021.

### Examination Format:

The grading of the examinations will conform to existing Woodruff School guidelines. The results of the three examinations (two written examinations and the oral examination) will be reviewed by the NRE/MP faculty and reported to the Woodruff School Office of Student Services and the Woodruff School academic faculty.

Students will be notified of the results of the exam (pass/fail in each area as well as an overall pass/fail grade) by letter from the Associate Chair for Graduate Studies. The Associate Chair will counsel each student who does not pass the exam. Students not passing the exam are encouraged to discuss their performance with their faculty advisors as well as the chairs of the appropriate area exam committees.

### RCR Training

Responsible Conduct of Research (RCR) (1 course, 1 hour, pass/fail). Georgia Tech requires that all PhD students complete an RCR requirement that consists of an online component and in-person training. The online component is completed during the student's first semester

enrolled at Georgia Tech. The in-person training is satisfied by taking PHIL 6000 or their associated academic program's in-house RCR course.

### **Seminar Requirement**

All Ph.D. students must register for Seminar **8014** (2 credit hours- no letter grade- attend at least 22 seminars).

The course is offered on a pass/fail basis and therefore is **not** included in the 42 semester-hours degree requirement. Attendance at a minimum of 22 seminars per credit hour is necessary to pass, with the attendance record being cumulative from semester to semester. Registration for these credits occurs after you attend the requisite number of seminars.

### **Teaching Practicum Requirement**

**All Woodruff School Ph.D. students are required to complete three semester hours of Teaching Practicum (ME/NRE 7757) during the course of their doctoral studies.**

Students enrolled in the teaching practicum will work closely with a Woodruff School faculty member in all aspects of teaching a course, including the preparation and delivery of a limited number of lectures (usually in the presence of the course professor) tutorials, evaluation of homework, laboratories, and examinations. The faculty member of record will maintain full responsibility for the course. You must do the teaching component and the classwork in the same term.

In addition to the mentored teaching component, students enrolled in the practicum must attend weekly lecture discussions focused on engineering pedagogy, ethics, professional development and leadership.

Students may **not** register for this course during the semester in which you expect to receive the Ph.D. ME/NRE 7757 is offered on a pass/fail basis and **cannot** be used to satisfy the 42 semester-hours course work requirement. Students are not allowed to perform GTA responsibilities in the course for which they are participating in the Teaching Practicum.

### **Proposal Presentation**

The objective of the Ph.D. Proposal is to allow an early assessment of your chosen topic of research for the satisfactory completion of the doctoral degree. The proposal should delineate your specific area of research by stating the purpose, scope, methodology, overall organization, and limitations of the proposed study area. The proposal should include a review of the relevant literature and indicate the expected contribution of the research. An oral presentation of the proposal must be undertaken open to public.

### **Dissertation Presentation**

**The defense must be at least six (6) months after your proposal presentation.**

After adequate preparation, you must complete an original and authoritative investigation in your chosen field that culminates in a written dissertation describing that investigation. An oral defense of the dissertation must be undertaken open to public.