Physics (Applied Physics), Ph.D.

Priority Admission Application Deadlines: http://www.grad.usf.edu/majors

Concentrations:
Medical Physics (Optional)

Contact Information

College: Arts and Sciences
Department: Physics

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The Department of Physics at the University of South Florida expresses an inclusive vision of applied physics. Some of us collaborate with engineers, others with mathematicians. In between, we always keep in mind the applications both of physics and of the results of our research. Applied Physics seeks both fundamental knowledge and new ideas that benefit society. Our research strengths include (but are not limited to) materials science, solid-state and condensed-matter physics, computational physics, biophysics, spectroscopy, and optics. Our graduates find employment in academia, national laboratories, hospitals, finance, and industry.

Accreditation
The Ph.D. degree program in “Applied Physics with an emphasis in medical-physics” has been accredited since 2015 by the Commission on the Accreditation of Medical Physics Education Programs, CAMPEP.

Admission Information

Must meet University Admission and English Proficiency requirements as well as requirements for admission to the major, listed below.

- three letters of recommendation
- a statement of purpose
- GRE General Test scores required, GRE Physics Subject Test scores recommended.

Applicants for admission to the Ph.D. program must indicate whether they are requesting the medical-physics concentration option.

Students Entering with Prior Master's Degrees from Other Institutions
Students entering with a prior master's degree from an institution other than USF must complete a minimum of 45 credit hours. The Director of Graduate Studies will evaluate coursework and may waive specific requirements with the substitution of other approved graduate coursework. However, at least six structured courses (18 credit hours) approved by the Director of Graduate Studies must be completed at USF in a discipline related to the Ph.D. Degree.

Curriculum Requirements

Total Minimum Hours: 72 credit hours post-bachelor's

- Core Requirements - 12 Credit Hours
- General Option or Concentration Option - 18 Credit Hours
- Other Courses - 18 Credit Hours
- Dissertation - 24 Credit Hours
For students entering with a prior non-USF master's degree:
Total Minimum hours: 45 Credit Hours post-master's

- Core Requirements - 12 Credit Hours
- Additional Structured courses - 6 Credit Hours
- Industrial Practicum or Medical Option Alternative - 3 Credit Hours
- Dissertation Research - 24 Credit Hours

Note: students entering with a prior master's degree may need more than 45 credit hours to satisfy all competencies.

Core Courses (12 Credit Hours)

- PHZ 5115 Methods of Theoretical Physics I **Credit Hours: 3**
- PHY 6346 Electromagnetic Theory I **Credit Hours: 3**
- PHY 6645 Quantum Mechanics I **Credit Hours: 3**
- PHY 6536 Statistical Mechanics **Credit Hours: 3**

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General Option or Concentration

Students complete either the General Option or the Concentration.

General Option (18 Credit Hours)

At least an additional six (6) graduate-level classes, of which at least five (5) are in Physics graduate-level classes (excluding research and seminars) not used to fulfill other requirements. Contact the department for a current list of approved courses. Any graduate-level class intended to count towards the degree and taken outside the department requires prior approval by the graduate director.

Medical-Physics Concentration Option (18 Credit Hours)

The Concentration is administered jointly by the Department of Physics of the University of South Florida and the Medical Physics Faculty Group of the Moffitt Cancer Center.

Students in the medical-physics concentration must perform medical physics research leading to a dissertation and a minimum of two papers submitted to peer-reviewed journals before graduation. In addition, the following courses are required:

- PHY 6938 Selected Topics in Physics **Credit Hours: 1-10**
  - Radiation Physics and Dosimetry (3 Credit Hours) (proposed PHZ 6736)
  - Radiobiology for Physicists (3 Credit Hours) (proposed PHZ 6730)
  - Radiation Therapy Physics (3 Credit Hours) (proposed RAD 6628)
- PHC 7935 Special Topics in Public Health **Credit Hours: 1-3 (3 credits for this program)**
- GMS 6605 Basic Medical Anatomy **Credit Hours: 3**
- EEE 6514 Biomedical Image Processing **Credit Hours: 3**

Other Required Courses - 18 Credit Hours
All students must complete 18 credit hours of other coursework. This includes:

- **PHZ 7940 Industrial Practicum Credit Hours: 3**
  Students in the medical physics concentration can substitute PHZ 6938 Radiotherapy Physics Clinical Practicum (3 Credit Hours) (proposed as PHZ 6938) for the Industrial Practicum.
  An additional 15 credit hours which may include additional electives, seminars, or PHY 7910 Directed Research to meet the minimum of 72 credit hours (post-bachelor's degree).

### Doctoral Qualifying Examination:

The Doctoral Qualifying Examination consists of two parts: The Credentials Certification and the Dissertation Proposal. Following successful completion of these two parts, the student may submit the paperwork for doctoral candidacy. The student's presentation of the Dissertation Proposal may occur at any time after successful completion of the Credentials Certification.

- **Credentials Certification**
  The Student, in consultation with his/her research advisor, will assemble a supervisory committee consistent with the rules of the Office of Graduate Studies. It is the responsibility of the supervisory committee to evaluate the student's academic and research accomplishments and potential according to departmental standards, and if these are met, to certify that the student may proceed to the next step. Contact the Department for details.

- **Dissertation Proposal**
  To become a Ph.D. Candidate, the student must present a written dissertation proposal and successfully defend that proposal to the supervisory committee. Contact the Department for details.

### Dissertation (24 Credit Hours)

- **PHY 7980 Dissertation: Doctoral Credit Hours: 2-12 (2-9 credits for this program)**

  The candidate will conduct original and significant research, describe that research and the results in a doctoral dissertation and defend that dissertation in an oral presentation to the supervisory committee. The defense is open to the public and must be scheduled according to the regulations of the Office of Graduate Studies.
Students select either the thesis or non-thesis option:

Non-Thesis Option

Students in the non-thesis option take an additional 9 hours of graduate electives. The remaining nine credit hours may be earned through a combination of approved graduate-level electives, approved graduate seminars, or directed research.

Thesis Option

- PHY 6971 Thesis: Master's **Credit Hours: 2-12**

  *PHY 7910 Directed Research hours may satisfy up to 50% of the thesis-hour requirement.*

Comprehensive Exam

The Thesis defense is used in lieu of the comprehensive exam. Non-thesis students complete a written exam.