APPLIED PHYSICS (PHD)

Graduate School

Program Website (https://www.aep.cornell.edu/aep/programs/graduate-programs/doctor-philosophy-applied-physics)

CIP: 14.1201 | **HEGIS:** 0919.00 | **NYSED:** 13334

Graduate Field

Applied Physics (https://catalog.cornell.edu/graduate-school/applied-physics/)

Program Description

The applied physics program combines a core physics curriculum with research and study in areas that also include the application of physics to the broader scientific and engineering communities. Students in applied physics may pursue research in any one of several broad areas, including nanoscience, advanced materials, condensed matter physics, renewable energy, quantum information and photonics, biological physics, or astrophysics and plasma physics.

The Ph.D. program in the graduate field of applied physics (AP) is a flexible, research-oriented doctoral program tailored to individual interests. AP combines a core physics curriculum with research and study usually in one of the areas discussed above. Graduate students can engage in a wide range of cross-disciplinary research activities, bringing their expertise as an applied physicist to bear, often in a collaborative environment. Instead of a qualifying exam, students are expected take classes in a common core of physics subjects, being quantum mechanics, electrodynamics, statistical mechanics, and advanced laboratory techniques.

Program Information

- Program Mode of Delivery: In Person
- Program Location: Ithaca, NY

Program Requirements

- Five semesters of GRAD research course
- Minimum Semesters for Degree: 6

Graduate School Milestones

- Responsible Conduct of Research Training: Required
- Open Researcher and Contributor ID (ORCID): Required
- Student Progress Reviews (SPR) begin: Second Year
- Examination for admission to candidacy (A Exam): After a minimum of four semesters
- Defense of Dissertation (B Exam): Two semesters after A exam

Field Specific Milestones

- Special Masters degree is conferred after a successful A Exam
- Students take a diagnostic exam in their first semester. The results are not retained in the student's record.

Course Requirements

Additional course requirements may be set by the student's Special Committee. Program specific requirements that apply to all students are included below.

Year 1

- 3 credits in Quantum Mechanics
- 3 credits in Electrodynamics
- 3 credits in Statistical Mechanics

Year 2

PHYS 6510 Advanced Experimental Physics

All subsequent terms

GRAD 9010 Graduate-Level Research

Graduate School Enrollment Requirements

Course Requirements

- Course requirements are determined by the student's Special Committee.
- Enrollment in a GRAD research course or the equivalent field specific research course is expected of all students each semester through graduation. These courses include:
  - GRAD 8000 In Absentia
  - GRAD 9010 Graduate-Level Research
  - GRAD 9011 Doctoral Dissertation Research
  - GRAD 9012 Master's Thesis Research
  - GRAD 9016 Summer Graduate-Level Research
  - GRAD 9050 Global Hubs: Research Partnerships
  - GRAD 9060 National Science Foundation Graduate Research Fellowship Program

University Graduation Requirements

Requirements for All Students

In order to receive a Cornell degree, a student must satisfy academic and non-academic requirements.

Academic Requirements

A student's college determines degree requirements such as residency, number of credits, distribution of credits, and grade averages. It is the student's responsibility to be aware of the specific major, degree, distribution, college, and graduation requirements for completing their chosen program of study. See the individual requirements listed by each college or school or contact the college registrar's office (https://registrar.cornell.edu/service-resources/college-registrar-directory) for more information.

Non-academic Requirements

Conduct Matters. Students must satisfy any outstanding sanctions, penalties or remedies imposed or agreed to under the Student Code of Conduct (Code) or Policy 6.4. Where a formal complaint under the Code or Policy 6.4 is pending, the University will withhold awarding a degree otherwise earned until the adjudication process set forth in those procedures is complete, including the satisfaction of any sanctions, penalties or remedies imposed.

Financial Obligations. Outstanding financial obligations will not impact the awarding of a degree otherwise earned or a student's ability to access their official transcript. However, the University may withhold issuing a diploma until any outstanding financial obligations owing to the University are satisfied.

Learning Outcomes

A candidate for a Ph.D. in Applied Physics is expected to demonstrate:

- Broad knowledge in the fundamental areas of physics and in-depth knowledge at highly advanced level in at least one sub-discipline of Applied Physics
- Breadth of interdisciplinary training
- The ability to synthesize and create knowledge by making an original and substantial contribution to an area of Applied Physics in an appropriate timeframe.

Proficiencies that are required to be demonstrated by the candidate:

- Demonstrate broad knowledge in the fundamental areas of applied physics, advanced knowledge in a subdiscipline, and interdisciplinary training.
  - Proficiency in basic physics
  - Advanced knowledge in an area of applied physics
  - Breadth of interdisciplinary training
- Make an original and substantial contribution to the discipline
  - Demonstrate independent thinking and creativity.
  - Develop and execute (an) original research plan(s).
  - Generate publishable advances in an area of applied physics.
- Demonstrate a commitment to advancing scholarship
  - Maintain familiarity with advances in the field.
  - Demonstrate commitment to personal professional development through engagement in professional societies, conference participations, and publications.
  - Show commitment to learning, collaborative inquiry, and mentoring.
- Demonstrate professional skills
  - Understand and maintain ethical standards in the field.
  - Listen to, give, and receive feedback effectively.

Admissions

Application Requirements and Deadlines

Application Deadlines

Fall, December 15

Requirements Summary

Applicants should have undergraduate preparation in physics or another physical science or in an engineering field with a strong emphasis on mathematics and modern physics. The GRE general and subject exams are not used in our evaluation process and should not be submitted.

- all Graduate School requirements (http://www.gradschool.cornell.edu/academics/admissions/applying), including the English language proficiency requirement (https://gradschool.cornell.edu/admissions/prepare/english-language-proficiency-requirement/)
- three recommendations

Admissions Contact Information

Email: aep_info@cornell.edu
Phone: 607-255-0638
Campus Address: 212 Clark Hall
Website: https://www.aep.cornell.edu/aep/programs/graduate-programs/doctor-philosophy-applied-physics