The general areas of graduate research in Electrical Engineering are electromagnetics and optics; electronics and photonics; communications, computers, networking, and signal processing; and control and power systems. Specializations available within these areas include:

- microwaves, antennas, and propagation;
- electro-optics and nonlinear optics;
- remote sensing and space systems;
- materials and devices;
- circuits and networks;
- VLSI;
- communications;
- networking;
- signal and image processing;
- computer vision and pattern recognition;
- control systems; and
- power systems.

Admission Requirements

Applicants apply for admission to the program via the Graduate School application for admission (http://gradschool.psu.edu/prospective-students/how-to-apply). Requirements listed here are in addition to Graduate Council policies listed under GCAC-300 Admissions (http://gradschool.psu.edu/graduate-education-policies).

Applicants are required to submit:

- scores from the GRE General Test,
- three letters of reference,
- a personal statement of relevant experience and goals,
- a resume,
- official transcripts from all post-secondary institutions attended (http://www.gradschool.psu.edu/prospective-students/how-to-apply/new-applicants/requirements-for-graduate-admission),
- and a supplemental application.
title degree program in Operations Research prior to taking the qualifying examination in their primary graduate program.

**Degree Requirements**

To qualify for the dual-title degree, students must satisfy the degree requirements for the degree they are enrolled in Electrical Engineering, listed in the Degree Requirements section. In addition, students must complete the degree requirements for the dual-title in Operations Research, listed on the Operations Research Bulletin page (http://bulletins.psu.edu/graduate/programs/majors/operations-research).

The qualifying examination committee for the dual-title Ph.D. degree will be composed of Graduate Faculty from Electrical Engineering and must include at least one Graduate Faculty member from the Operations Research program. Faculty members who hold appointments in both programs’ Graduate Faculty may serve in a combined role. There will be a single qualifying examination, containing elements of both Electrical Engineering and Operations Research. Dual-title graduate degree students may require an additional semester to fulfill requirements for both areas of study and, therefore, the qualifying examination may be delayed one semester beyond the normal period allowable.

In addition to the general Graduate Council requirements for Ph.D. committees (http://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/phd-dissertation-committee-formation), the Ph.D. committee of an Electrical Engineering and Operations Research dual-title Ph.D. student must include at least one member of the Operations Research Graduate Faculty. Faculty members who hold appointments in both programs’ Graduate Faculty may serve in a combined role. If the chair of the Ph.D. committee is not also a member of the Graduate Faculty in Operations Research, the member of the committee representing Operations Research must be appointed as co-chair. The Operations Research representative on the student’s Ph.D. committee will develop questions for and participate in the evaluation of the comprehensive examination.

Students in the dual-title program are required to write and orally defend a dissertation on a topic that is approved in advance by their Ph.D. committee and reflects their original research and education in Electrical Engineering and Operations Research. Upon completion of the doctoral dissertation, the candidate must pass a final oral examination (the dissertation defense) to earn the Ph.D. degree. The dissertation must be accepted by the Ph.D. committee, the head of the graduate program, and the Graduate School.

**Student Aid**

Graduate assistantships available to students in this program and other forms of student aid are described in the Tuition & Funding section of The Graduate School’s website. Students on graduate assistantships must adhere to the course load limits (http://gradschool.psu.edu/graduate-education-policies/gsad/gsad-900/gsad-901-graduate-assistants) set by The Graduate School.

In addition, the following awards typically have been available to graduate students in this program:

- Paul F. Anderson Graduate Fellowship
- Melvin P. Bloom Memorial Graduate Fellowship
- Luther B. and Patricia A. Brown Graduate Fellowship
- Joseph R. and Janice M. Monkowski Graduate Fellowship
- James R. and Barbara R. Palmer Fellowship
- Pontano Family Scholarship in Electrical Engineering

- Society of Penn State Electrical Engineers (SPSEE) Graduate Fellowship
- Fred C. and M. Joan Thompson Graduate Fellowship
- Bess L. and Mylan R. Watkins Graduate Fellowship

**Courses**

Graduate courses carry numbers from 500 to 699 and 800 to 899. Advanced undergraduate courses numbered between 400 and 499 may be used to meet some graduate degree requirements when taken by graduate students. Courses below the 400 level may not. A graduate student may register for or audit these courses in order to make up deficiencies or to fill in gaps in previous education but not to meet requirements for an advanced degree.

Electrical Engineering (EE) Course List (https://bulletins.psu.edu/university-course-descriptions/graduate/ee)

**Contact**

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- **Telephone:** (814)863-7294
- **Program Website:** Electrical Engineering at University Park (http://www.eecs.psu.edu/students/graduate/Graduate-Degree-Programs-EE.aspx)