PhD in Electrical Engineering

General Academic Program Requirements

The PhD program meets the need of each student through an individualized learning program. The program is structured within general guidelines set by the department that establish the scope of the educational experience to be achieved by each student. For students who already hold an MS degree in an appropriate field, the PhD program requires a minimum of eight courses beyond the MS degree. For students who wish to pursue a direct-BS-to-PhD (without earning an MS along the way) the PhD program requires a minimum of 14 graduate courses, including no more than four independent study courses. To meet the residency requirement, students must complete a minimum of 24 credits at Binghamton University.

Admission

Applications received for the PhD program are administratively divided into three categories. The categories are:

1) students who are about to complete an MS degree in the department;
2) students who have completed or are about to complete an MS degree elsewhere; and
3) exceptional students completing their BSEE degree with a cumulative GPA above 3.7.

Students in the first category — i.e., in their last semester of the MSEE programs — may apply for the PhD program by indicating their intent to continue for the PhD on the Recommendation for Award of Master's Degree form that is submitted at the completion of the MS degree.

Students who have completed an appropriate master's degree elsewhere can apply for the PhD program.

Exceptional baccalaureate students with a GPA above 3.7 in the BSEE program are eligible for direct admission to the PhD program.

Students apply to the PhD program by submitting a completed application and application fee to the Graduate School. Application forms are available at [http://www.binghamton.edu/grad-school/prospective-students/admission-requirements.html](http://www.binghamton.edu/grad-school/prospective-students/admission-requirements.html). The application must include all transcripts, GRE scores, the TOEFL or IELTS score if English is a second language, two letters of recommendation, a statement of research interests, and a current resume.
PhD Advisor and Guidance Committee

The PhD student’s research advisor is central in directing the student’s development. Upon admission to the doctoral program, new students have as their advisor the ECE graduate director until an advisor is identified on the PhD Principal Advisor/Guidance Committee Form. A Guidance Committee Form should be completed during the first semester in residence.

The guidance committee must have a minimum of three members, two of whom must be from the ECE department (including the principal advisor). Each of these members is expected to take an active role in supervising the student’s development. Members, in addition to those mentioned above, may be added to enhance the committee. An outside examiner will be assigned by the vice provost of graduate studies and research.

When a proposed committee has been identified, the names and signatures are submitted on a Principal Advisor/Guidance Committee Form to the ECE graduate director. Once approved by the ECE graduate director, the form is forwarded to the graduate coordinator’s office. When the guidance committee is approved, the form is placed on file in the graduate coordinator’s office. Any subsequent changes made to the membership of this committee must be documented in a new copy of the Principal Advisor/Guidance Committee Form.

Learning Contract

The new doctoral student should start to work immediately with his or her advisor to develop a learning contract. The purpose of the learning contract is to define the knowledge and skills required in order to pass the comprehensive examination. The learning contract should identify core courses and concepts that must be mastered in order to provide breadth of background, as well as specialized courses and concepts germane to the proposed area of research. The learning contract may be modified later if additional knowledge is required or if the field of research is changed. A model for the learning contract is available from the coordinator of graduate studies.

A copy of the learning contract, with signatures indicating approval of the guidance committee, is placed in the student’s file in the graduate coordinator’s office.
Qualifying Examination

After the completion of one semester or nine credits, the student is required to take a
department-wide qualifying written examination. Only the student’s principal advisor
may give an extension to this date. Students are encouraged to attempt this
examination as early in their program as possible. On the qualifying examination,
students must demonstrate quantitative skills and subject knowledge in two core areas
within ECE. A description of the qualifying examination is given in the Graduate
Handbook on the ECE graduate webpage.

Comprehensive Examination and Admission to Candidacy

After completion of the required courses, and before completion of a significant portion
of the dissertation research, the student must complete the comprehensive
examination. This is an individual examination, with responsibility for the content given
to the student’s guidance committee. The ECE graduate director is an ex officio member
of the comprehensive examination committee to ensure uniformity in the level of
examinations within the department. Once the guidance committee and graduate
director have agreed on the examination content and format, it is clearly explained to
the student and the examination date set. After successfully completing the
comprehensive examination and any additional requirements such as the development
of communication skills, the student is admitted to candidacy for the doctorate. The
Graduate School is notified of the satisfactory completion of the comprehensive
examination and the student’s admission to candidacy on the Recommendation for
Admission to Candidacy for Doctoral Degree Form. Note that the candidate is required
to defend the dissertation within five years of admission to candidacy.

Dissertation Prospectus

Upon completion of the comprehensive examination, the candidate prepares a
prospectus, describing the proposed research. This prospectus is presented and
defended in an open colloquium. Upon acceptance of the prospectus by the guidance
committee, a copy is filed with the Watson School graduate coordinator.

Evidence of Proficiency in Teaching

The candidate is required to meet the teaching proficiency requirement in one of the
following ways:

1. be an instructor of record in an undergraduate course;
2. complete practicum in teaching course and teach one or more seminars or a portion
   of a course; or
3. show evidence of past teaching experience comparable to the first and second
   choices above, which must be verified and approved by the guidance committee.
Dissertation Defense

If an external examiner was not chosen at the time the Recommendation for Admission to Candidacy for Doctoral Degree form was submitted to the Graduate School, then the chair of the guidance committee makes a recommendation to the ECE graduate director, who upon approval of the recommendation forwards it to the dean of the Graduate School. The dean makes a formal appointment of the external examiner. The external examiner reviews and participates in the dissertation defense with the guidance committee. After distribution of the dissertation for review, an oral defense of the PhD dissertation is scheduled. The PhD candidate is required to present an oral defense of his or her dissertation in an open colloquium. Upon the candidate's satisfactory defense of the dissertation, the ECE graduate director submits a signed copy of the Recommendation for Award of Doctoral Degree form to the graduate coordinator’s office. After verification of completion of the program of study, the graduate coordinator forwards the recommendation form to the Graduate School.

All forms are available in the Watson School graduate coordinator's office. All forms must be signed by the ECE graduate director and submitted to the Watson School graduate coordinator's office.