PH.D. IN ENGINEERING (COMPUTER SCIENCE & ENGINEERING)

OVERVIEW

The Ph.D. degree in Engineering (with computer science and engineering concentration) is conferred on the basis of extended study and high scholarly attainment in the field of computer science and engineering. The students are expected to apply advanced and specialized knowledge and skills, gained through the program, to solve novel and complex problems in the domains of computer science or computer engineering, and develop appropriate professional skills. In the course of the program, the students will demonstrate effective communication skills and competency commensurate with the doctoral education by making an original and substantial contribution to the field of computer science or computer engineering.

Graduate courses and research include topics in computer systems design and applications (hardware and software); artificial intelligence; machine vision and imaging; computer networks; computer graphics and visualization; cyber security; hardware-oriented security and trust; social networking; and high performance computing.

The program prepares students with advanced and up-to-date knowledge and skills to pursue careers as scientists/researchers/educators in the various fields of computer science and computer engineering. The doctoral program provides the foundation needed to become leaders as well as productive scholars or developers of innovative solutions to technological problems in these fields.

ADMISSION REQUIREMENTS

Admission to the Ph.D. in Engineering (concentration in computer science and engineering) program requires a B.S. or an M.S. degree in computer science, computer engineering or a closely related field.

Application requirements:

- **Degree:** Applicants must hold a four-year bachelor's degree from a regionally accredited college or university.

- **GPA:** Applicants must have at least a 3.0/4.0 grade point average from previous undergraduate and graduate coursework.

- **Application:** UToledo application required

- **GRE:** Required for applicants whose degree is from a non-US institution.

- **Transcripts:** Required

- **Statement of Purpose:** Required

- **Letters of Recommendation:** minimum of 2 required

- **Proof of English language proficiency:** Required for students from non-English speaking countries. See University graduate admissions for minimum test score requirements and exceptions.

Application priority deadlines for admissions and funding decisions:

- **Fall:** March 1

- **Spring:** October 1

- **Summer:** Contact department

Admission decisions are made on an individual basis and take into account the applicant's test results and previous academic and research record, the intended area of study, and the capacity of the EECS department to advise and support Ph.D. students and Ph.D. level research projects.

PROGRAM REQUIREMENTS

Ph.D. students must complete a total of at least 90 hours of graduate credit (including 45 credit hours of dissertation) beyond the bachelor's degree, or 60 credit hours beyond the M.S. degree. Doctoral candidacy requires selection of an academic advisor, formation of a dissertation committee, and satisfactory performance on the doctoral qualifying examination. Candidates are awarded the Ph.D. degree following:

a. Satisfactory completion of the requisite credit hours beyond the M.S. / B.S. degree (the M.S. or B.S. degree must be in a closely related field); and

b. Successful defense of a dissertation that constitutes a fundamental advancement of knowledge in the field.

The Ph.D. typically takes a minimum of three full years of graduate work beyond the M.S. degree.

The general requirements for the Ph.D. degree are:

- A minimum of 60 credit hours beyond the M.S. degree or a minimum of 90 credit hours beyond the B.S. degree. Out of these credit hours, a minimum of 45 credit hours should be devoted to research toward the student's dissertation.
- No more than three credit hours of independent study for students with an M.S. degree and no more than 9 credit hours of independent study for students with a B.S. degree may be counted toward the Ph.D. course requirement.
- The student must pursue, complete and publish a research manuscript that is demonstrated to be an original contribution to the field of study.
- The dissertation must be written and successfully defended publicly before the Ph.D. degree is conferred.
- Students must submit a minimum of two journal papers based on the dissertation research. Copies of the accepted/published papers, or official letters of acknowledgments for the submitted papers must be given to the graduate director at least one week prior to the dissertation defense date.
- The student is required to take the 1cr.h. EECS seminar course and pass with an S grade.

Ph.D. Qualifying Examination

The intent of the Ph.D. Qualifying Examination is to assess the student's potential for successfully completing doctoral level studies and research in the department. The students are tested in four areas: two based on the required core courses of the specialization area; and two based on the recommended courses list in the student's specialization areas, chosen in consultation with the student's advisor. The examination is given in two written parts.

Further details pertaining to the qualifying examination, as well as course registration requirements, Plan of Study requirements, and PhD proposal defense requirements can be found in the EECS Graduate Handbook.

A document containing the courses and the specialization areas of the PhD CSE program is attached below.

It is the responsibility of the student and the faculty advisor to formulate a program of study that satisfies the requirements for the Ph.D. degree. The student's program of study should promote depth of knowledge through one of the specialization areas associated with Computer Science and Engineering. The program of study must be approved by the faculty advisor, the Advisory Committee, the Graduate Program Director, the Associate Dean of Graduate Studies of the College of Engineering, and the College of Graduate Studies.

PhD/CSE (the student has a BS degree in CS, CE, or a related field - 90 cr hr required)

Code	Title	Hours
Core Courses		9
Recommended Courses		30
EECS 8990	Independent Study	5
EECS 5930	Electrical Engineering & Computer Science Seminar	1
EECS 8960	Dissertation	45
Total Hours		**90**

PhD/CSE (the student has an MS degree in CS, CS or a related field - a minimum of 60 cr hr required)

Code	Title	Hours
Core Courses		9
Recommended Courses		6
EECS 5930	Electrical Engineering & Computer Science Seminar	1
EECS 8960	Dissertation	45
Total Hours		**61**

- PLO 1. Apply advanced and specialized knowledge and skills gained through the program to solve novel and complex problems in the domains of computer science or computer engineering.\\n
- PLO 2. Demonstrate competency commensurate with the doctoral education by making an original and substantial contribution to the body of knowledge in computer science or computer engineering.\\n
- PLO 3. Demonstrate effective communication skills.\\n
- PLO 4. Demonstrate professional skills appropriate to the discipline.