

# COMPUTER ENGINEERING, PH.D.

## Learning Outcomes

- Students will demonstrate knowledge of computer architecture.
- Students will demonstrate knowledge of compiler construction.
- Students will demonstrate knowledge of the theory of computation.
- Students will demonstrate knowledge of the analysis of algorithms.
- At the time of graduation a Doctor of Philosophy student should be able to perform research involving computer systems for the solution of problems.
- At the time of graduation a Doctor of Philosophy student should be able to formulate problems in their research area that are challenging and of wide interest in the area.
- At the time of graduation a Doctor of Philosophy student should be able to actively contribute to the research in their area.
- At the time of graduation a Doctor of Philosophy student should be able to communicate effectively about their research in computer science and engineering.

## Degree Requirements (60 Post-Baccalaureate Hours)

Requirements for the Ph.D. degree in Computer Engineering fall into four categories: course requirements, the qualifying examination, the comprehensive examination, and the dissertation.

### Core (10 Hours)

The coursework must include the following core courses.

| Course             | Title                            | Credits |
|--------------------|----------------------------------|---------|
| CSCE 513           | Computer Architecture            | 3       |
| CSCE 611           | Advanced Digital Design          | 3       |
| CSCE 750           | Analysis of Algorithms           | 3       |
| CSCE 791           | Seminar in Advances in Computing | 1       |
| Total Credit Hours |                                  | 10      |

### Computer Engineering Elective (3 Hours)

| Course                       | Title                            | Credits |
|------------------------------|----------------------------------|---------|
| Select one of the following: |                                  | 3       |
| CSCE 512                     | System Performance Evaluation    |         |
| CSCE 516                     | Computer Networks                |         |
| CSCE 569                     | Parallel Computing               |         |
| CSCE 574                     | Robotics                         |         |
| CSCE 613                     | Fundamentals of VLSI Chip Design |         |
| Total Credit Hours           |                                  | 3       |

### Dissertation Preparation (12 Hours)

| Course             | Title                    | Credits |
|--------------------|--------------------------|---------|
| CSCE 899           | Dissertation Preparation | 12      |
| Total Credit Hours |                          | 12      |

### Advanced CSCE Electives (20 Hours)

In addition to the above requirements, students must complete 20 hours in CSCE courses numbered 700 or above.

### Other Electives (15 Hours)

- In addition to the above requirements, students must complete 15 hours of CSCE courses numbered above 500.
- Graduate level courses from other departments, with approval from Graduate Director, can satisfy this requirement.
- Students who enter the program with a Master's degree in Computer Engineering are exempt from this requirement.

Note: Students entering the program without a Masters degree are encouraged to enroll concurrently in and earn an MS in Computer Engineering.

At most 9 hours of CSCE 798 and not more than 12 hours of CSCE 899 may be applied toward the degree. Neither CSCE 797 nor CSCE 799 may be applied toward the degree.

The student's dissertation committee must approve the program of study, so this committee should be formed as early in a student's course of study as possible. Prior to admission to candidacy, the student is required to pass a written qualifying examination. This examination is designed to test fundamental knowledge and conceptual understanding of the mainstream areas of computer engineering. The Ph.D. comprehensive examination combines a written and an oral examination and seeks to discover whether the student has a sufficiently deep understanding of topics in the area of interest to carry out the proposed research. The dissertation committee, which also will make the final decision on whether the student has passed, constructs the research component. The oral examination is an in-depth test on the subject matter related to the student's dissertation topic and written exam. The committee may also examine the student on any other material it deems relevant. After completing the research and writing the dissertation, the student must defend the work in a public presentation.