

COMPUTER SCIENCE AND ENGINEERING

Degree Requirements

Master of Engineering (M.Eng.)

Requirements listed here are in addition to Graduate Council policies listed under GCAC-700 Professional Degree Policies (<https://gradschool.psu.edu/graduate-education-policies/>).

A minimum of 30 credits at the 400, 500, or 800 level is required, with a minimum of 18 credits at the 500 or 800 level, and at least 6 credits at the 500 level.

| Code | Title | Credits |
|------------------------------|--|-----------|
| Fall Semester | | |
| CMPSC 465 | Data Structures and Algorithms | 3 |
| 6 credits of the following: | | 6 |
| CMPSC 443 & CMPSC 431 | Introduction to Computer and Network Security and Database Management Systems | |
| CMPEN 431 & CMPEN 472 | Introduction to Computer Architecture and Microprocessors and Embedded Systems | |
| 3 credits of the following: | | 3 |
| CSE 500 - CSE 589 | | |
| CSE 597 | Special Topics | |
| Spring Semester | | |
| 12 credits of the following: | | 12 |
| CSE 500 - CSE 589 | | |
| CSE 597 | Special Topics | |
| Summer Semester | | |
| CSE 820 | Software & Hardware Project Management | 3 |
| CSE 594 | Research Topics | 3 |
| Total Credits | | 30 |

The culminating experience for the program is a master's paper completed while the student is enrolled in CSE 594.

Master of Science (M.S.)

Requirements listed here are in addition to Graduate Council policies listed under GCAC-600 Research Degree Policies. (<https://gradschool.psu.edu/graduate-education-policies/>)

A minimum of 31 credits at the 400, 500, 600, or 800 level is required, with at least 18 credits at the 500 and 600 level, combined. Students may choose to complete a thesis or a scholarly paper. Students choosing to complete a thesis must complete at least 6 credits in thesis research (600 or 610). Students choosing to complete a scholarly paper must complete at least 18 credits in 500-level courses.

| Code | Title | Credits |
|---|-------|---------|
| Required Courses | | |
| 15-18 credits of CSE courses with at least 15 credits of 500-level courses including any taken from the 9 credit breadth areas (thesis option); at least 18 credits of 500-level courses including any taken from the 9 credit breadth areas (non-thesis option); at most 9 credits of 400-level courses including any taken from the list below. | | 15-18 |

9 credits with one course each in the following three breadth areas: algorithms (CMPSC 465 or CSE 565), operating systems (CMPSC 473 or CSE 511), and computer architecture (CMPEN 431 or CSE 530).

| | | |
|-------------------------------|---|-----------|
| CMPSC 465 | Data Structures and Algorithms | |
| or CSE 565 | Algorithm Design and Analysis | |
| CMPSC 473 | Operating Systems Design & Construction | |
| or CSE 511 | Operating Systems Design | |
| CMPEN 431 | Introduction to Computer Architecture | |
| or CSE 530 | Fundamentals of Computer Architecture | |
| CSE 590 | Colloquium | 1 |
| Culminating Experience | | |
| CSE 600 | Thesis Research (Thesis) | 6 |
| or CSE 610 | Thesis Research Off-Campus | |
| CSE 594 | Research Topics (Scholarly Paper) | 3 |
| Total Credits | | 31 |

Students who choose to complete a thesis must pass a thesis defense. The thesis must be accepted by the advisers and/or committee members, the head of the graduate program, and the Graduate School. If the student completes a scholarly paper, the paper must be accepted by the supervising faculty member(s) and the head of the graduate program. The scholarly paper is completed while the student is enrolled in CSE 594.

Doctor of Philosophy (Ph.D.)

Requirements listed here are in addition to Graduate Council policies listed under GCAC-600 Research Degree Policies. (<https://gradschool.psu.edu/graduate-education-policies/>)

Students applying for and gaining admittance to the Ph.D. program will not be permitted to switch to the master's program at a later date, except under extenuating circumstances, at the discretion of the program.

To qualify for a Ph.D. degree, students who do not have an M.S. degree in Computer Science or Computer Engineering must take a minimum of 33 credits, including:

| Code | Title | Credits |
|--|---|-----------|
| Required Courses | | |
| 6 credits of the following: | | 6 |
| CSE 565 | Algorithm Design and Analysis | |
| CSE 511 | Operating Systems Design | |
| CSE 530 | Fundamentals of Computer Architecture | |
| 15 credits of CSE courses (excluding CSE 596 and CSE 598) | | 15 |
| 9 credits of 400-, 500-, or 800-level courses in CSE/EE/MATH/STAT, or 500- or 800-level IST courses (which may include up to 3 credits of CSE 596) | | 9 |
| CSE 590 | Colloquium | 2 |
| CSE 591 | Research Experience in Computer Science and Engineering | 1 |
| Total Credits | | 33 |

Students admitted to the Ph.D. program with an M.S. degree in Computer Science or Computer Engineering must take a minimum of 21 credits, including:

| Code | Title | Credits |
|-----------------------------|-------|---------|
| Required Courses | | |
| 6 credits of the following: | | 6 |

| | | |
|--|---|-----------|
| CSE 565 | Algorithm Design and Analysis | |
| CSE 511 | Operating Systems Design | |
| CSE 530 | Fundamentals of Computer Architecture | |
| 9 credits of CSE courses (excluding CSE 596 and CSE 598) | | 9 |
| 3 credits of 400-, 500-, or 800-level courses in CSE/EE/MATH/STAT, or 500- or 800-level IST courses (which may include up to 3 credits of CSE 596) | | 3 |
| CSE 590 | Colloquium | 2 |
| CSE 591 | Research Experience in Computer Science and Engineering | 1 |
| Total Credits | | 21 |

A student must pass the Ph.D. qualifying examination by the third regular semester after entering the program. After completion of most of the course work and meeting the English competency requirement, students must pass the Ph.D. comprehensive examination.

A dissertation must be completed under the direction of the Ph.D. committee and the results must be successfully defended in the final oral examination. To earn the Ph.D. degree, doctoral candidates must write a dissertation that is accepted by the Ph.D. committee, the head of the graduate program, and the Graduate School.