

Computational Science, Engineering, and Mathematics (PhD)

schools and colleges. The program is designed for outstanding students who desire expertise in multiple disciplines and are willing to take on new challenges by working alongside faculty involved in research at the forefront of computational science.

Graduate study in computational science, engineering, and mathematics comprises three areas: (1) applicable mathematics, (2) numerical analysis and scientific computation, and (3) mathematical modeling and applications. Within these broad areas, the student may take courses in applied mathematics and statistics, data science, numerical analysis and scientific computing, computational mechanics and physics, parallel computing and computer architecture, and mathematical modeling, and in supporting areas in science and engineering that involve mathematical modeling of physical, biological, social, or engineered systems. Students perform research in a broad range of areas, including scientific computing, uncertainty quantification, machine learning, numerical analysis, optimization, visualization, computational medicine, computational geosciences, computational materials, computational life sciences, computational physical sciences, computational engineering, and many more.

Graduate Handbook

Graduate handbook information is updated and maintained by each program. Graduate handbooks are available within each program's office and [online](#). Please contact the program with concerns or questions.

Admission

Students entering the program are expected to have an undergraduate degree in engineering, computer sciences, mathematics, or a natural science such as biology, physics, chemistry, or geology.

Total hours required: 30

Requirements

Each student develops a program of study that includes a substantial component in each of three areas of concentration: applicable mathematics, numerical analysis and scientific computation, and mathematical modeling for applications in a science or engineering discipline. The program must be reviewed and approved by the Graduate Studies Committee. Lists of courses in the three concentrations are available from the graduate advisor.

Before admission to candidacy for the degree, each student develops a program of study that draws courses from each of the three areas of concentration; the program must be approved by the Graduate Studies Subcommittee. The student must also pass an examination in each area. In addition to meeting the area requirements, the student must prepare a written dissertation proposal. Oral presentation of the proposal and an oral examination are required.

A dissertation is required of every candidate, followed by a final oral examination covering the dissertation and the general field of the dissertation.

Code	Title	Hours
All students must also follow the requirements and policies below:		
Graduate University Requirements		

The program is unique in its interdisciplinary emphasis. Faculty are drawn from a large number of academic departments representing five