

Computational Engineering

Graduate Coordinator: Dr. Manav Bhatia

Center for Advanced Vehicular Systems (CAVS)

Box 9618

Mississippi State, MS 39762

Telephone: 662-325-5431

E-mail: cme-coordinator@hpc.msstate.edu

An Interdisciplinary Curriculum

The Computational Engineering graduate program is interdisciplinary, with faculty drawn from the academic departments of the College of Engineering and the College of Arts and Sciences, as well as the research faculty of the HPC². Programs of study and research leading to both the Master of Science degree and the Doctor of Philosophy degree are offered on the Starkville Campus and through Distance Education. There is an increased demand by industry, academia, and government for scientists and engineers with a better knowledge of the skills necessary to create new technologies and improve upon existing ones through simulation tools. Such programs come with curricula covering a large range of subjects, so that they can produce scientists and engineers with broad backgrounds and viewpoints. These scientists and engineers can then be expected to understand the basic approaches to solving analytical problems and also using mathematical and computational tools required to arrive at solutions. The program is open to students with undergraduate degrees in engineering, computer science, mathematics, or a physical science. Research assistantships are available through research projects in the HPC².

Admission Criteria

To be admitted, the student must meet the admission requirements of the Office of the Graduate School and receive a positive recommendation from the Computational Engineering Graduate Coordinator. International students must have scored at least 550 PBT (79 iBT) on the Test of English as a Foreign Language (TOEFL) or 6.5 on the International English Language Testing System (IELTS). Students with a degree from a program that is not EAC/ABET accredited must have a satisfactory performance on the GRE.

In addition, highly qualified undergraduate students, with a minimum equivalent GPA of 3.50/4.00 on the last 60 credit hours of undergraduate courses, or a first class with distinction degree classification for students from institutions where no GPA is reported, plus satisfactory performance on the GRE for students from a non-ABET-accredited program, can be directly admitted to the Ph.D. program.

Provisional Admission

An applicant who has not fully met the GPA requirement stipulated by the University may be admitted on a provisional basis. The provisionally-admitted student is eligible for a change to regular status after receiving a 3.00 GPA on the first 9 hours of graduate courses at Mississippi State University (with no grade lower than a C). The first 9 hours of graduate courses must be within the student's program of study. Courses with an S grade, transfer credits, or credits earned while in Unclassified status cannot be used to satisfy this requirement. If a 3.00 is not attained, the provisional student **shall** be dismissed from the graduate program. Academic departments may set higher standards for students to fulfill provisional requirements; a student admitted with provisional status should contact the graduate coordinator for the program's specific requirements. While in the provisional status, a student is not eligible to hold a graduate assistantship.

Program of Study

The specific requirements for the degrees are governed by the requirements of the Office of the Graduate School, the College of Engineering, and by the student's graduate committee. The committee must include at least one Computational Engineering faculty member from each of the following areas:

1. a Computational Engineering application area,
2. high-performance computing, and
3. numerical mathematics.

The graduate committee will ensure that the student's program of study adequately addresses each of the three primary cross-disciplinary areas (an application area, high-performance computing, and numerical mathematics), and students are encouraged to include one or more courses in scientific visualization or data analytics. The composition of the graduate committee and the student's program of study must be approved by the Computational Engineering Graduate Coordinator.

Academic Performance

For students enrolled in either the M.S. or Ph.D. program, all issues related to academic probation, dismissal, and appeal will be governed by University policy, as approved by Graduate Council and the Provost and outlined by the Graduate School in the Graduate Catalog.

Graduate Courses

Because of the interdisciplinary nature of the Computational Engineering program, courses listed under the "Courses" tab are typical of those used to assemble a program of study. Courses not listed can be used for graduate credit with the approval of the student's supervisory committee and the Computational Engineering Program Coordinator (p.). The program of study must demonstrate the student has achieved a working knowledge of

1. a Computational Engineering application area,
2. high-performance computing, and
3. numerical mathematics.

Master of Science in Computational Engineering - Thesis

| | |
|--------------------------------------|------------------------------------------------------|
| 8000-level coursework | 12 |
| Additional graduate-level coursework | 12 |
| Research/thesis | 6 |
| CME 8000 | Thesis Research/ Thesis in Computational Engineering |
| Total Hours | 30 |

Master of Science in Computational Engineering - Non-Thesis

| | |
|--------------------------------------|--------------------------------------------------------|
| 8000-level coursework | 15 |
| Additional graduate-level coursework | 15 |
| Research project | 3 |
| CME 7000 | Directed Individual Study in Computational Engineering |
| Total Hours | 33 |

Doctor of Philosophy in Computational Engineering

The Doctor of Philosophy in Computational Engineering, in addition to the coursework and research hours, includes a comprehensive examination, a dissertation, and dissertation defense. Each candidate for the doctoral degree must conduct research and in their dissertation defense on that research

1. demonstrate a mastery of the techniques of research and
2. make a very distinct contribution to the field of Computational Engineering.

The dissertation must conform to the rules of the Office of the Graduate School.

For direct-admit Ph.D. students, 72 credit hours beyond the B.S. are required (48 credit hours of coursework and 24 credit hours of dissertation research).