

Computational Engineering/ Computational Science, Engineering, and Math (BSCompE/MSCSEM)

The integrated degree program leads to sequential awarding of a Bachelor of Science in Computational Engineering (BSCompE) degree followed by a Master of Science in Computational Science, Engineering, and Math (MSCSEM) degree. The Integrated BSCompE/ MSCSEM program is designed to prepare students to become leaders in Computational Science, Engineering, and Math in academia and in industry. The program requires completion of a total of 152 credit hours: 122 SCH for the BSCompE degree and 30 SCH for the MSCSEM degree. Students can complete the integrated program in five academic years of full-time study.

Information regarding the integrated program requirements and policies may be obtained from the Computational Science, Engineering and Math Academic Advising Office in POB 4.102.

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.

Total Hours Required: 152

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.

Plan of Study

The Plan of Study is a suggested four-year course sequence to support academic planning and serves as a helpful guide. Currently enrolled students should meet with their academic advisor to tailor their course selections and timelines to their individual goals and circumstances.

Course	Title	Hours
Year 1		
Semester 1		
CH 301	Principles of Chemistry I	3
<u>First-Year Signature Course (090)</u>		3
M 408C	Differential and Integral Calculus	4
RHE 306	Rhetoric and Writing	3
<u>Social and Behavioral Sciences (080)</u>		3
Hours		16
Semester 2		
COE 301	Introduction to Computer Programming	3
M 408D	Sequences, Series, and Multivariable Calculus	4
PHY 303K	Engineering Physics I	3
PHY 105M	Laboratory For Physics 302K, 303K, and 317K	1
M E 210	Engineering Design Graphics	2
<u>U.S. History (060)</u>		3
Hours		16

Year 2		
Semester 1		
E M 306	Statics	3
COE 322	Scientific Computation	3
M 427J	Differential Equations with Linear Algebra	4
PHY 303L	Engineering Physics II	3
PHY 105N	Laboratory For Physics 302L, 303L, and 317L	1
M E 310T	Applied Thermodynamics	3
Hours		17
Semester 2		
COE 311K	Engineering Computation	3
COE 332	Software Engineering and Design	3
E M 311M	Dynamics	3
M 427L	Advanced Calculus for Applications II	4
<u>American and Texas Government (070)</u>		3
Hours		16
Year 3		
Semester 1		
ASE 320	Low-Speed Aerodynamics	3
E S 333T	Engineering Communication	3
COE 352	Topics in Advanced Scientific Computations	3
E M 319	Mechanics of Solids	3
COE 362 or M 362K	Engineering Probability and Statistics or Probability I	3
Hours		15
Semester 2		
ASE 330M	Linear System Analysis	3
COE 321K	Computational Methods for Structural Analysis	3
COE 347	Introduction to Computational Fluid Dynamics	3
Technical Elective		3
Hours chosen from:		3
Hours		15
Year 4		
Semester 1		
ASE 375	Electromechanical Systems	3
Technical Elective		3
Technical Elective		3
<u>Visual and Performing Arts (050)</u>		3
<u>American and Texas Government (070)</u>		3
Hours		15
Semester 2		
COE 374	Senior Design Project	3
Technical Elective		3
Technical Elective		3
<u>U.S. History (060)</u>		3
Hours		12
Year 5		
Semester 1		
Graduate Coursework		15
Hours		15
Semester 2		
Graduate Coursework		15
Hours		15
Total Hours		152

Requirements

All requirements are listed below, starting with the most specialized moving to the most general. Additional requirements may follow the table, so be sure to read the entire page. Some required courses listed below may also satisfy [General Education](#) requirements, including [Core Curriculum](#).

Code	Title	Hours
Undergraduate		
Degree		
COE 301	Introduction to Computer Programming	3
COE 311K	Engineering Computation	3
COE 321K	Computational Methods for Structural Analysis	3
COE 322	Scientific Computation	3
COE 332	Software Engineering and Design	3
COE 347	Introduction to Computational Fluid Dynamics	3
COE 352	Topics in Advanced Scientific Computations	3
COE 374	Senior Design Project	3
ASE 320	Low-Speed Aerodynamics	3
ASE 330M	Linear System Analysis	3
ASE 375	Electromechanical Systems	3
CH 301	Principles of Chemistry I	3
E M 306	Statics	3
E M 311M	Dynamics	3
E M 319	Mechanics of Solids	3
M 408C	Differential and Integral Calculus	4
M 408D	Sequences, Series, and Multivariable Calculus	4
M 427J	Differential Equations with Linear Algebra	4
M 427L	Advanced Calculus for Applications II	4
COE 362	Engineering Probability and Statistics	3
or M 362K	Probability I	
M E 210	Engineering Design Graphics	2
M E 310T	Applied Thermodynamics	3
PHY 105M	Laboratory For Physics 302K, 303K, and 317K	1
PHY 105N	Laboratory For Physics 302L, 303L, and 317L	1
PHY 303K	Engineering Physics I	3
PHY 303L	Engineering Physics II	3
Approved technical electives		15
E S 333T	Engineering Communication	3
RHE 306	Rhetoric and Writing	3
Free electives: Additional coursework to reach total hours required.		0
<i>Subtotal</i>		<i>98</i>
General Education		
<u>Remaining Core Curriculum (42 hours total)</u>		24
<u>Foreign Language other than English, Beginning Proficiency</u>		
<i>Subtotal</i>		<i>24</i>
<u>College Requirements - Engineering</u>		
<u>General University Requirements</u>		
Graduate		
Graduate Coursework		30
All students must also follow the requirements and policies below:		
<u>Graduate Natural Sciences Requirements</u>		
<u>Graduate University Requirements</u>		
<i>Subtotal</i>		<i>30</i>
Total Hours		152

Additional Requirements and Policies

Courses used to fulfill technical elective requirements must be approved by the computational engineering faculty before the student enrolls in them.

The student must take all courses required for the degree on the letter-grade basis and must earn a grade of at least C- in each course, except

for those listed as Remaining Core Curriculum Courses. Students must also maintain grade point averages of at least 2.00 in the major area of study and in required technical courses as described in [Academic Standards](#), and a cumulative University grade point average of at least 2.00 as described in [General Information](#).

Technical Electives

The technical electives allow students to focus in a specific area. Of the 15 hours in the degree plan, the following distribution is required. The list of approved electives may be found on the department website.

- Advanced Elective: At least six hours must be chosen from the approved list of advanced electives.
- Math/Computational Elective: Up to six hours may be chosen from the approved list of math/computational electives or six more hours of advanced electives.
- Foundational Elective: Three hours must be chosen from the approved list of foundational electives.