This course plan is a recommended sequence for this major. Courses designated as critical (I) may have a deadline for completion and/or affect time to graduation. Please see the Program Notes section for details regarding “critical courses” for this particular Program of Study.

<table>
<thead>
<tr>
<th>Semester One (16-17 Credit Hours)</th>
<th>Course Subject and Title</th>
<th>Credit Hours</th>
<th>Min. Grade</th>
<th>Program GPA</th>
<th>Code</th>
<th>Prerequisites</th>
<th>Notes</th>
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<tr>
<td>ENGL 101 Critical Reading and Composition</td>
<td>3</td>
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<tr>
<td>! MATH 141 Calculus I</td>
<td>4</td>
<td>C</td>
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<td>C or better in MATH 112/115/116 or Math placement test score</td>
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<tr>
<td>! CHEM 111 General Chemistry I</td>
<td>3</td>
<td>C</td>
<td>CC-SCI</td>
<td>C or better in MATH 111/115/122/141 or higher Math or Math placement test; Coreq: CHEM 111L</td>
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<tr>
<td>! CHEM 111L General Chemistry I Lab</td>
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<td>MATH 111 or 115; Prereq or Coreq: CHEM 111L</td>
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<tr>
<td>ECHE 101 Intro. to Chemical Engineering (or ENCP 101)</td>
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<tr>
<th>Semester Two (15 Credit Hours)</th>
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<th>Credit Hours</th>
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<td>ENGL 102 Rhetoric and Composition</td>
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<td>! MATH 142 Calculus II</td>
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<tr>
<td>! CHEM 112 General Chemistry II</td>
<td>3</td>
<td>C</td>
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<td>C or better in CHEM 111, MATH 111/115/122/141 or higher math; Coreq: CHEM 112L</td>
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<td>C or better in CHEM 111/111L/141; Prereq or Coreq: CHEM 112</td>
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<td>! PHYS 211 Essentials of Physics I</td>
<td>3</td>
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<td>C or better in MATH 141; Coreq: PHYS 211L</td>
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<tr>
<td>! PHYS 211L Essentials of Physics I Lab</td>
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<td>Prereq or Coreq: C or better in PHYS 211</td>
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<td>! ECHE 300 Chemical Process Principles</td>
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<td>Professional Development Elective</td>
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<td>! ECHE 310 Intro. to Chem. Engr. Thermodynamics (or ENCP 290)</td>
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<td>C or better in ECHE 300; Prereq or Coreq: MATH 241</td>
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<td>! MATH 241 Vector Calculus</td>
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<td>C or better in MATH 142</td>
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<td>! CHEM 333 Organic Chemistry I</td>
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<td>PHYS 212 Essentials of Physics II</td>
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<td>C or better PHYS 211 and MATH 142; Coreq: PHYS 212L</td>
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<td>! PHYS 212L Essentials of Physics II Laboratory</td>
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<td>Prereq or Coreq: C or better in PHYS 212</td>
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<tr>
<td>! ECHE 311 Chem. Engr. Thermodynamics</td>
<td>3</td>
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<td>! ECHE 320 Chem. Engr. Fluid Mechanics (or ENCP 360)</td>
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<td>ECHE 456 Computational Methods for Engineering Applications</td>
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<td>! MATH 242 Elem. Differential Equations</td>
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<th>Semester Five (15 Credit Hours)</th>
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<th>Min. Grade</th>
<th>Program GPA</th>
<th>Code</th>
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<tr>
<td>! ECHE 321 Heat-Flow Analysis</td>
<td>3</td>
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<td>C or better in ECHE 320 or ENCP 360 &amp; MATH 242; Prereq or Coreq: D or better in ECHE 456</td>
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<td>! ECHE 440 Separation Process Design</td>
<td>3</td>
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<td>C or better in ECHE 300; Prereq or Coreq: ECHE 311</td>
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<td>ECHE 550 Chem.-Proc. Dynamics &amp; Control</td>
<td>3</td>
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<td>Chemistry Elective</td>
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<th>Semester Six (15 Credit Hours)</th>
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<tr>
<td>! ECHE 322 Mass Transfer</td>
<td>3</td>
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<td>D or better in ECHE 321</td>
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<tr>
<td>! ECHE 460 Chemical Engineering Lab</td>
<td>3</td>
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<td>MR</td>
<td>Prereq or Coreq: ECHE 311 &amp; ECHE 321</td>
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<tr>
<td>Engineering Elective</td>
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<tr>
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<tr>
<td>Carolina Core AIU</td>
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<td>CC-AIU</td>
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M. Moss
Semester Seven (15 Credit Hours)

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<tr>
<th>Course</th>
<th>Hours</th>
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<th>Prereq or Coreq</th>
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<tbody>
<tr>
<td>ECHE 430 Chemical Engineering Kinetics</td>
<td>3</td>
<td>* MR</td>
<td>C or better in ECHE 311; Prereq or Coreq; D or better in ECHE 321 or BMEN 354</td>
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<tr>
<td>ECHE 461 Chemical Engineering Lab II fall only</td>
<td>3</td>
<td>* MR</td>
<td>ECHE 460; Prereq or Coreq: ECHE 430 &amp; 440</td>
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<tr>
<td>ECHE 465 Chem. Proc. Anal. &amp; Design I fall only</td>
<td>3</td>
<td>* MR</td>
<td>Prereq or Coreq: ECHE 430 &amp; 440</td>
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Technical Elective 10

Technical Elective 11

Technical Elective 11

Career Elective

Take during any semester (0-6 Credit Hours)

- Carolina Core GFL 4-14
- 0-6 CC-GFL

Graduation Requirements Summary

<table>
<thead>
<tr>
<th>Minimum Total Hours</th>
<th>Minimum Major Requirements Hours</th>
<th>College &amp; Program Requirements Hours</th>
<th>Carolina Core Hours</th>
<th>Minimum Institutional GPA</th>
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<td>131</td>
<td>33</td>
<td>64-65</td>
<td>34-40</td>
<td>2.00</td>
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1. Regardless of individual course grades, students must maintain a minimum 2.00 cumulative GPA.
2. Some colleges require a minimum GPA for major courses. Courses indicated in this column are included in the Chemical Engr. program GPA of 2.00.
3. Students who place into MATH 115 will be required to successfully complete it before taking MATH 141.
5. A list of acceptable Professional Development Elective courses is maintained in the department office and in the Bulletin. The list includes: ECHE 202 & ECHE 203.
6. Chemistry Lab Electives (2 hours): CHEM 321L (or 322L), 331L (or 333L), 332L (or 334L), 541L, 542L, 550L, 621L.
7. The Carolina Core provides a common core of knowledge, skill, and academic experience for all Carolina undergraduate students. Students in the College of Engineering & Computing are required to demonstrate proficiency in one foreign language equivalent to the 121 course by 1) a score of two or better on the foreign language placement test; or 2) completion of the 109 & 110 courses in FREN, GERM, LATN, or SPAN or completion of the 121 course in another foreign language. Students who do not place out of the CFL requirement may need to take additional hours to meet this requirement.
8. Career Elective: A list of acceptable Career Elective courses is maintained in the department office and the Bulletin. The list includes: UNIV 101, all Carolina Core Liberal Arts courses (AIU, CMS, GFL, GHS, GSS, and VSR), and all Engineering Electives, Chemistry Electives, Chemistry Lab Electives and all Technical Electives courses.
10. Engineering Electives (6 hours): ENCP 200 (or ECIV 200 or EMCH 200), 201 (or EMCH 201), 210 (or ECIV 210 or EMCH 310), 260 (or ECIV 220 or EMCH 260), 330 (or EMCH 330), 440, 460, 481, 499, 540, BMEN 211, 212, 240, 260, 263, 271, 290, 300 and above, except 301 and 303, CSCE 211, 212, 240, 261, 311, 317, 520, 567, 582, 587; ECHE 202 (or 203), 372, 389, 497, 499, 520, 521, 571, 572, 573, 574, 575, 589; ECIV 300 and above, except 360; ELCT 220, 221, 222, 300 and above; EMCH 300 and above, except 354 and 360.
11. Technical Electives (12 hours): Includes all courses listed as Engineering Electives, Chemistry Electives, & Chemistry Lab Electives as well as ENCP 102 (or EMCH 111), MATH 300, 374, MATH 500 and above; STAT 500 and above except 541 and 591; BIOI 101, 101L, 102, 102L, 120, 120L, 200 and above; ENVR 231, 321, 331; GEOL 300 and above; MSCI 300 and above; PHYS 300 and above; CSCE 145 (unless completed as the Computer Programming Elective), 146, 210, 215, 350; ACCT 222; FINA 333; MGMT 371; MGSC 290; MKTG 350.

Program Notes:
- Courses identified as "critical" must be completed by the semester in which they are listed in order to ensure a timely graduation due to prerequisite requirements for subsequent required courses.
- All undergraduate students must take a 3-credit course or its equivalent with a passing grade that covers the founding documents. This course may fulfill any requirement in the program of study. Courses that meet this requirement are listed in the academic bulletin.
- A student cannot repeat courses from the College of Engineering & Computing in which they earned a grade of C or better. In addition, a student cannot repeat any course from the College a second time. No more than four courses from the College of Engineering and Computing may be repeated in order to satisfy the requirements for any degree from the College, regardless of satisfactory work. For this purpose, withdrawal from a course with a grade of W is not regarded as enrollment in that course. A student that does not satisfactorily complete a degree-required course within two attempts must change major or transfer out of the College of Engineering and Computing.
- The B.S.E. with Distinction is available to students majoring in chemical engineering who wish to participate in significant research and/or design activities in chemical engineering with a faculty mentor. More details are available on the Bulletin.
- The last 25% of a student’s degree must be completed in residence at the University, and at least half of the hours in the student’s major courses and in the student’s minor courses (if applicable) must be taken at the University.
- Disclaimer: Prerequisites on courses are subject to change. Please refer to Bulletin.

University Requirements: Bachelor’s degree-seeking students must meet Carolina Core (general education) requirements. For more information regarding these requirements, please visit the Carolina Core page on the University website.

Codes:

- CC Carolina Core
- CC-AIU Carolina Core-Aesthetic and Interpretive Understanding
- CC-ARP Carolina Core-Analytical Reasoning and Problem-Solving
- CC-CMS Carolina Core-Effective, Engaged, and Persuasive Communication: Spoken Component
- CC-CMV Effective, Engaged, and Persuasive Communication: Written Component
- CC-GFL Carolina Core-Global Citizenship and Multicultural Understanding: Foreign Language
- CC-GHS Carolina Core—Historical Thinking
- CC-GSS Carolina Core—Social Sciences
- CC-INF Carolina Core—Information Literacy
- CC-INF Carolina Core—Integrative Course
- CC-SIG Carolina Core—Scientific Literacy
- CC-VSR Carolina Core — Values, Ethics, and Social Responsibility
- CR College Requirement
- MR Major Requirement
- PR Program Requirement

Disclaimer: Major maps are only a suggested or recommended sequence of courses required in a program of study. Please contact your academic advisor for assistance in the application of specific coursework to a program of study and course selection and planning for upcoming semesters.