



This course plan is a recommended sequence for this major. Courses designated as critical (!) 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.

Critical	Course Subject and Title	Credit Hours	Min. Grade ¹	Major GPA ²	Code	Prerequisites	Notes
Semester One (16 Credit Hours)							
!	ENGL 101 Critical Reading and Composition	3	C		CC-CMW		
!	MATH 141 Calculus 1 ³	4	C		CC-ARP	C or better in MATH 112/115/116 <i>or</i> Math placement test score	
!	CHEM 111 & CHEM 111L – General Chemistry I	4	C		CC-SCI	C or better in MATH 111/115/122/141 <i>or</i> Math placement test score	
!	ECHE 101 Intro. to Chemical Engineering	2		*	PR		
	Carolina Core Requirement ⁴ & ⁵	3			CC		
Semester Two (18 Credit Hours)							
!	ENGL 102 Rhetoric and Composition	3			CC-CMW CC-INF	C or better in ENGL 101	
!	MATH 142 Calculus II	4	C		CC-ARP	C or better in MATH 141	
!	CHEM 112 & CHEM 112L – General Chemistry II	4			PR	C or better in CHEM 111 <i>or</i> 141 <i>and</i> MATH 111/115 <i>or</i> higher math	
!	PHYS 211 & PHYS 211L – Essentials of Physics I	4	C		CC-SCI	C or better in MATH 141	
!	ECHE 300 Chemical Process Principles	3	C	*	PR	MATH 141; Prereq <i>or</i> Coreq: CHEM 112	
Semester Three (18 Credit Hours)							
	ECHE 202 Exploring the Chem. Engr. Workplace <i>or</i> BMEN 202 Prof. Dev. & Ethics in Biomed. Engr. II	1		*	PR	Prereq <i>or</i> Coreq: ECHE 300 (<i>ECHE 202 only</i>); BMEN 101 (<i>BMEN 202 only</i>)	
!	ECHE 310 Intro. to Chem. Engr. Thermodynamics	3		*	PR	C or better in ECHE 300; Prereq <i>or</i> Coreq: MATH 241	
!	MATH 241 Vector Calculus	3			PR	C or better in MATH 142	
!	CHEM 333 Organic Chemistry I Chemistry Lab Elective ⁶	3 1	C		PR	C or better in CHEM 112 <i>or</i> CHEM 142 See course listing in the Bulletin .	
!	PHYS 212 & PHYS 212L – Essentials of Physics II	4			PR	C or better PHYS 211 <i>and</i> MATH 142	
	Carolina Core Requirement ⁴ & ⁵	3			CC		
Semester Four (16 Credit Hours)							
!	ECHE 311 Chem. Engr. Thermodynamics	3		*	PR	ECHE 310 <i>or</i> ENCP 290	
!	ECHE 320 Chem. Engr. Fluid Mechanics	3		*	PR	PHYS 211; Prereq <i>or</i> Coreq: MATH 241	
!	MATH 242 Elem. Differential Equations	3	C		PR	C or better in MATH 142	
!	CHEM 334 Organic Chemistry II Chemistry Lab Elective ⁶	3 1			PR	C or better in CHEM 333 See course listing in the Bulletin .	
	Carolina Core Requirement ⁴ & ⁵	3			CC		
Semester Five (18 Credit Hours)							
!	ECHE 321 Heat-Flow Analysis	3		*	MR	ECHE 320 <i>or</i> ENCP 360 & C or better in MATH 242	
!	ECHE 440 Separation Process Design	3		*	MR	C or better in ECHE 300	
!	ECHE 550 Chemical-Process Dynamics & Control	3		*	MR	C or better in ECHE 300 & MATH 242	
	Technical Elective ⁷	3			PR	See course listing in the Bulletin .	
	Chemistry Elective ⁸	3			PR	See course listing in the Bulletin .	
	Carolina Core Requirement ⁴ & ⁵	3			CC		
Semester Six (15 Credit Hours)							
!	ECHE 322 Mass Transfer	3		*	MR	C or better in ECHE 320	
!	ECHE 460 Chemical Engineering Lab 1	3		*	MR	ECHE 311 & ECHE 321	
	Engineering Elective ⁹	3		*	PR	See course listing in the Bulletin .	
	Technical Elective ⁷	3			PR	See course listing in the Bulletin .	
	Carolina Core Requirement ⁴ <i>or</i> Liberal Arts Elective ⁵	3			CC		
Semester Seven (15 Credit Hours)							
!	ECHE 430 Chemical Engineering Kinetics	3		*	MR	ECHE 311; Prereq <i>or</i> Coreq: ECHE 321	
!	ECHE 461 Chemical Engineering Lab II	3		*	MR	ECHE 460; Prereq <i>or</i> Coreq: ECHE 430 & 440	
!	ECHE 465 Chemical Process Analysis & Design I	3		*	MR	Prereq <i>or</i> Coreq: ECHE 430 & 440	
	Chemistry Elective ⁸	3			PR	See course listing in the Bulletin .	
	Carolina Core Requirement ⁴ <i>or</i> Liberal Arts Elective ⁵	3			CC		

Semester Eight (15 Credit Hours)							
	ECHE 466 Chemical Process Analysis & Design II	3		*	MR/CC-INT	ECHE 430, 440, 465; Prereq or Coreq: ECHE 322, 550, 567	
	ECHE 567 Process Safety, Health & Loss Prevention	3		*	MR		
	Engineering Elective ⁹	3		*	PR	See course listing in the Bulletin .	
	Technical Electives ⁷	3			PR	See course listing in the Bulletin .	
	Technical Electives ⁷	3			PR	See course listing in the Bulletin .	

Graduation Requirements Summary

Minimum Total Hours	Major Requirements Hours	College & Program Requirements Hours	Minimum Carolina Core Hours	Minimum Overall GPA
131	30	61-67	34-40	2.00

- Regardless of individual course grades, students must maintain a minimum 2.00 cumulative GPA.
- Some colleges require a minimum GPA for major courses. Courses indicated in this column are included in the major GPA of 2.00 for this program.
- Students who place into MATH 115 will be required to successfully complete it before taking MATH 141.
- The [Carolina Core](#) provides the common core of knowledge, skill and academic experience for all Carolina undergraduate students. Students in the College of Engineering and 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 and 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 GFL requirement may need to take additional hours to meet this requirement. This major map also assumes that students complete two Carolina Core overlay courses. Additional hours may be required to meet all Carolina Core requirements if no overlay courses are taken.
- A total of 6 courses (18 hours) of Carolina Core/Liberal Arts Electives are required. These must include courses that satisfy Carolina Core requirements for AIU, CMS, GHS, GSS, and VSR. If an overlay course is used to satisfy two components of the Carolina Core, then two Liberal Arts Electives are needed in addition to those courses fulfilling the Carolina Core requirements. If five stand-alone courses are used to satisfy the five Carolina Core requirements (AIU, CMS, GHS, GSS, and VSR), then one additional Liberal Arts Elective is needed. At least one of the six courses used to satisfy a Carolina Core/Liberal Arts Elective requirement must be at the 300-level or above *and* in the same field of study as one of the other five courses. A list of acceptable Liberal Arts Elective courses is maintained in the department office and the Bulletin. The list includes all Carolina Core Liberal Arts courses (AIU, CMS, GFL, GHS, GSS, and VSR), and other department approved courses.
- Chemistry Lab Electives (2 hours):** CHEM 321L, CHEM 331L (or 333L), CHEM 332L (or 334L), CHEM 541L, CHEM 542L, CHEM 550L, CHEM 591L, CHEM 592L, CHEM 621L.
- 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 374, MATH 500 and above; STAT 500 and above except 541 and 591; BIOL 101, BIOL 101L, BIOL 102, BIOL 102L, BIOL 120, BIOL 120L, BIOL 200 and above; GEOL any course; MSCI any course; PHYS 300 and above; CSCE 145, CSCE 146, CSCE 206, CSCE 210, CSCE 215, CSCE 350.
- Chemistry Electives (6 hours):** CHEM 321, CHEM 511, CHEM 533, CHEM 541, CHEM 542, CHEM 545, CHEM 550, CHEM 555, CHEM 556, CHEM 621, CHEM 622, CHEM 623, CHEM 624, CHEM 633, CHEM 644.
- Engineering Electives (6 hours):** ENCP 200 (or ECIV 200 or EMCH 200), ENCP 201 or EMCH 201, ENCP 210 (or ECIV 210 or EMCH 310), ENCP 260 (or ECIV 220 or EMCH 260), ENCP 330 (or EMCH 330), ENCP 460, ENCP 481, ENCP 499, ENCP 540; BMEN 211, BMEN 260, BMEN 271, BMEN 290, BMEN 300 and above, except 301 and 303; CSCE 211, CSCE 212, CSCE 240, CSCE 313, CSCE 317, CSCE 374; ECHE 372, ECHE 389, ECHE 456, ECHE 497, ECHE 499, ECHE 520, ECHE 571, ECHE 572, ECHE 573, ECHE 574, ECHE 589; ECIV 300 and above, except 360; ELCT 220, ELCT 221, ELCT 222, 300 and above; EMCH 300 and above, except 354 and 360.

Program Notes:

- Courses identified as “critical” must be completed in the semester in which they are listed in order to ensure a timely graduation due to prerequisite requirements for subsequent required courses.
- A student cannot repeat courses from the College of Engineering and 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 College 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](#).
- Students may pursue any of the following concentrations by choosing specified engineering, technical, and chemistry elective courses to fulfill degree requirements: Biomolecular Engineering, Energy, Interdisciplinary Engineering, Materials, Environmental Engineering, & Numerical Methods & Computing. To fulfill the requirements of any concentration, a student must complete five courses (15 credit hours) in one area and which must be approved by the student’s advisor and by the department. Consult the [Bulletin](#) for a list of approved concentration courses.
- The last 30 credit hours toward your degree and at least half of the major must be earned in residence at the University of South Carolina-Columbia.

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

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.