Major Map: Mechanical Engineering
Bachelor of Science in Engineering (B.S.E.)
College of Engineering and Computing
Department of Mechanical Engineering
Bulletin Year: 2024-2025

UNIVERSITY OF South Carolina

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.

!	Course Subject and Title	Credit Hours	Min. Grade[1]	Program GPA[2]	Code	Prerequisites	Notes
Semester One (17 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 or Math placement test score	
	CHEM 111 General Chemistry I	3	C		CC-SCI	C or better in MATH 111/115/122/141 or higher math or Math placement test; Coreq: CHEM 111L	
	CHEM 111L General Chemistry I Lab	1	C		CC-SCI	MATH 111 or 115; Prereq or Coreq: CHEM 111	
	EMCH 101 Intro. to Mechanical Engineering (or ENCP 101)	3		*	PR		
	Elective[7] (UNIV 101 recommended)	3			PR	See Bulletin listing.	
Semester Two (17 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	
	PHYS 211 Essentials of Physics I	3	C		CC-SCI	C or better in MATH 141; Coreq: PHYS 211L	
	PHYS 211L Essentials of Physics I Lab	1	C		CC-SCI	Prereq or Coreq: C or better in PHYS 211	
	CSCE 106 Sci. Applications Programming	3			PR	C or better in MATH 122 or 141	
	EMCH 111 Intro. to Computer-Aided Design (or ENCP 102)	3		*	PR		
Semester Three (15-18 Credit Hours)							
!	EMCH 200 Statics (or ENCP 200)	3	C	*	PR	C or better in MATH 141	
!	EMCH 201 Intro. to Applied Numerical Methods *(cross-listed: ENCP 201, PHYS 311)*	3		*	PR	MATH 141; Prereq or Coreq: MATH 142	
	ELCT 220 Electrical Engineering for Non-Majors (or ELCT 221 Circuits)	3		*	PR	MATH 142 (ELCT 220) or C or better in MATH 142; C or better in either ELCT 102 or AESP 265 or D or better in ELCT 220 (ELCT 221 only)	
!	MATH 241 Vector Calculus	3	C		PR	C or better in MATH 142	
	Carolina Core VSR[4]	3			CC-VSR		
	Carolina Core CMS[4]	0-3			CC-CMS		
Semester Four (15 Credit Hours)							
!	EMCH 260 Solid Mechanics (or ENCP 260)	3		*	PR	C or better in MATH 241 & EMCH 200 or ENCP 200	
!	EMCH 290 Thermodynamics (or ENCP 290)	3		*	PR	C or better in PHYS 211 & MATH 142	
!	MATH 242 Elem. Differential Equations	3	C		PR	C or better in MATH 142	
	Math/Science Elective[5]	3			PR		
	Carolina Core GSS[4]	3			CC-GSS		
Semester Five (16 Credit Hours)							
!	EMCH 310 Dynamics (or ENCP 210)	3		*	MR	C or better in MATH 242 & EMCH 200 or ENCP 200	
!	EMCH 360 Fluid Mechanics (or ENCP 360)	3		*	MR	C or better in EMCH 200 or ENCP 200 or BMEN 212 & D or better in EMCH 290 or ENCP 290 or BMEN 290 & C or better in MATH 242	
!	EMCH 361 Mechanical Engineering Lab I	3		*	MR	D or better in EMCH 290, ENCP 290, or BMEN 290. D or better in EMCH 260 or ENCP 260. D or better in EMCH 201 or ENCP 201. D or better in ELCT 220 or ELCT 221.	
	EMCH 368 Mechatronics	4		*	MR	D or better in CSCE 106, & ELCT 220 or ELCT 221, & EMCH 260 or ENCP 260	
!	EMCH 380 Project Management	3		*	MR	C or better in MATH 241	
Semester Six (15 Credit Hours)							
!	EMCH 332 Kinematics	3		*	MR	D or better in EMCH 310 or ENCP 210	
!	EMCH 354 Heat Transfer	3		*	MR	D or better in EMCH 360 or AESP 265 or ENCP 360	
!	EMCH 362 Mechanical Engineering Lab II	3		*	MR	D or better in EMCH 361; Prereq or Coreq: D or better in EMCH 360 or AESP 265 or ENCP 360 & D or better in EMCH 310 or ENCP 210	
	EMCH 367 Controls	3		*	MR	D or better in EMCH 368 & either EMCH 310 or ENCP 210	
	EMCH 327 Machine Design or EMCH 394 Applied Thermodynamics	3		*	MR	EMCH 260 or ENCP 260 *(EMCH 327)*; D or better in EMCH 201 or ENCP 201 & D or better in EMCH 290 or ENCP 290 *(EMCH 394)*	
Semester Seven (15-18 Credit Hours)							
!	EMCH 371 Materials	3		*	MR	D or better in EMCH 260 or ENCP 260	
!	EMCH 427 Design I	3		*	MR CC-INT	D or better in EMCH 380; Prereq or Coreq: D or better in EMCH 332, 354, 362, 371, & 368	
	EMCH Elective[6]	3		*	PR	See Bulletin listing.	

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Course	Hours			Code	Prerequisite/Notes	
Math/Science Elective[5]	3			PR	See Bulletin listing.	
Carolina Core GHS[4]	3			CC-GHS		
Carolina Core GFL[9]	0-3			CC-GFL		
Semester Eight (15-18 Credit Hours)						
EMCH 377 Manufacturing	3	*		MR	D or better in EMCH 371	
EMCH 428 Design II	3	*		MR	D or better in EMCH 427	
EMCH Elective[6]	3	*		PR	See Bulletin listing.	
Elective[7]	3			PR	See Bulletin listing.	
Carolina Core AIU[4]	3			CC-AIU		
Carolina Core GFL[9]	0-3			CC-GFL		

Graduation Requirements Summary

Minimum Total Hours	Minimum Major Requirements Hours	College & Program Requirements Hours	Minimum Carolina Core Hours	Minimum Institutional GPA
125	43	48	34	2.00

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 Mechanical Engineering program GPA of 2.00.
3. Students who place into MATH 115 will be required to successfully complete it before taking MATH 141.
4. The Carolina Core provides the common core of knowledge, skill and academic experience for all Carolina undergraduate students.
5. **Math/Science Electives** (6 hours): BIOL 110 or 300 and above, CHEM 112 or higher, MATH 300 or higher, PHYS 212 or higher, STAT 506 or higher.
6. **EMCH Electives** (6 hours): **EMCH** 308, 441, 460, 497, or any EMCH course numbered 500 or higher.
7. **Elective** (6 hours): Any course taken at the University or transferred in as a University course that does not essentially duplicate a course otherwise applied to the degree. A list of such courses that **cannot** be used as a free elective is maintained in the department office. This list includes: **ENCP** 101, 102, 200, 201, 210, 260, 290, 330, 360, 491, 492; **ECHE** 101, 310, 320, 321; **ECIV** 101, 111, 200, 201, 210, 220, 360; **BMEN** 101, 211, 260; **ELCT** 101.
8. Students are encouraged to complete PHIL 325 Engineering Ethics as an overlay course for VSR and CMS.
9. 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.

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 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 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 the 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-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.