MECHANICAL ENGINEERING, B.S.E.

Degree Requirements (125 hours)
See College of Engineering and Computing (https://academicbulletins.sc.edu/undergraduate/engineering-computing/) for progression requirements and special academic opportunities.

Program of Study

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<th>Requirements</th>
<th>Credit Hours</th>
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<td>1. Carolina Core</td>
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<td>2. College Requirements</td>
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Founding Documents Requirement
All undergraduate students must take a 3-credit course or its equivalent with a passing grade in the subject areas of History, Political Science, or African American Studies that covers the founding documents including the United States Constitution, the Declaration of Independence, the Emancipation Proclamation and one or more documents that are foundational to the African American freedom struggle, and a minimum of five essays from the Federalist papers. This course may count as a requirement in any part of the program of study including the Carolina Core, the major, minor or cognate, or as a general elective. Courses that meet this requirement are listed here (https://academicbulletins.sc.edu/undergraduate/founding-document-courses/).

1. Carolina Core Requirements (34-46 hours)

CMW – Effective, Engaged, and Persuasive Communication: Written (6 hours)
- ENGL 101 - must be passed with a grade of C or higher.
- ENGL 102

ARP – Analytical Reasoning and Problem Solving (8 hours)
Must be passed with a grade of C or higher.
- MATH 141
- MATH 142

SCI – Scientific Literacy (8 hours)
Must be passed with a grade of C or higher.
- CHEM 111 & CHEM 111L
- PHYS 211 & PHYS 211L

GFL – Global Citizenship and Multicultural Understanding: Foreign Language (0-6 hours)
Score two or better on foreign language placement test; or complete the 109 and 110 courses in FREN, GERM, LATN or SPAN; or complete the 121 course in another foreign language.

- CC-GFL courses (https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/)

GHS – Global Citizenship and Multicultural Understanding: Historical Thinking (3 hours)
- any CC-GHS course (https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/)

GSS – Global Citizenship and Multicultural Understanding: Social Sciences (3 hours)
- any CC-GSS course (https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/)

AIU – Aesthetic and Interpretive Understanding (3 hours)
- any CC-AIU course (https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/)

CMS – Effective, Engaged, and Persuasive Communication: Spoken Component ¹ (0-3 hours)
Select from the following:
- PHIL 325 (CMS/VSR overlay)
- any overlay or stand-alone CC-CMS course (https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/)

INF – Information Literacy ¹ (0-3 hours)
Select from the following:
- ENGL 102 (CMW/INF overlay)
- any overlay or stand-alone CC-INF course (https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/)

VSR – Values, Ethics, and Social Responsibility ¹ (0-3 hours)
Select from the following:
- PHIL 325 (CMS/VSR overlay)
- any overlay or stand-alone CC-VSR course (https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/)

1 Carolina Core Stand Alone or Overlay Eligible Requirements — Overlay-approved courses offer students the option of meeting two Carolina Core components in a single course. A maximum of two overlays is allowed. The total Carolina Core credit hours for this program must add up to a minimum of 34 hours.

2. College Requirements (0 hours)
No college-required courses for this program.

3. Program Requirements (48 hours)

Supporting Courses (42 hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCE 106</td>
<td>Scientific Applications Programming</td>
<td>3</td>
</tr>
<tr>
<td>MATH 241</td>
<td>Vector Calculus</td>
<td>3</td>
</tr>
<tr>
<td>MATH 242</td>
<td>Elementary Differential Equations</td>
<td>3</td>
</tr>
</tbody>
</table>
Select Math/Science Electives
Select two courses from: BIOL 110 or BIOL 301 and above, CHEM 112 or higher, MATH 300 or higher, PHYS 212 or higher, STAT 506 or higher course.

Lower Division Engineering
- EMCH 101 Introduction to Mechanical Engineering 3
- EMCH 111 Introduction to Computer-Aided Design 3
- EMCH 200 Statics (must be passed with a grade of C or higher) 3
- EMCH 201 Introduction to Applied Numerical Methods 3
- EMCH 260 Solid Mechanics 3
- EMCH 290 Thermodynamics 3
- ELCT 220 Electrical Engineering for Non-Majors 3
- EMCH 290 Thermodynamic Fundamentals 3
- ENCP 101 Introduction to Engineering 3
- ENCP 200 Statics 3
- ENCP 201 Introduction to Applied Numerical Methods 3
- ENCP 210 Dynamics 3
- ENCP 260 Introduction to the Mechanics of Solids 3
- ENCP 290 Thermodynamic Fundamentals 3
- ENCP 330 Introduction to Vibrations 3
- ENCP 360 Fluid Mechanics 3
- ENCP 491 Capstone Design Project I 3
- ENCP 492 Capstone Design Project II 3

4. Major Requirements (43 hours)

Course | Title | Credits
--- | --- | ---
EMCH 310 | Dynamics | 3
or ENCP 210 | Dynamics | 3
EMCH 332 | Kinematics | 3
EMCH 354 | Heat Transfer | 3
EMCH 360 | Fluid Mechanics | 3
or ENCP 360 | Fluid Mechanics | 3
EMCH 361 | Laboratory I | 3
EMCH 362 | Laboratory II | 3
EMCH 367 | Controls | 3
EMCH 368 | Mechatronics | 4
EMCH 371 | Materials | 3
EMCH 377 | Manufacturing | 3
EMCH 380 | Project Management | 3
EMCH 427 | Design I | 3
EMCH 428 | Design II | 3
EMCP 327 | Machine Design | 3
or EMCH 394 | Applied Thermodynamics | 3

Total Credit Hours 43

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. Courses that cannot be used includes:

Course | Title | Credits
--- | --- | ---
BMEN 101 | Introduction to Biomedical Engineering | 1
ECHE 101 | Introduction to Chemical Engineering | 2
ECHE 310 | Introductory Chemical Engineering | 3
ECHE 441 | Automotive System Fundamentals | 3
EMCH 320 | Chemical Engineering Fluid Mechanics | 3
ECHE 321 | Heat-Flow Analysis | 3
ECIV 101 | Introduction to Civil Engineering | 3
ECIV 111 | Introduction to Engineering Graphics and Visualization | 3
ECIV 200 | Statics | 3
ECIV 201 | Computational Methods for Civil Engineering | 3
ECIV 210 | Dynamics | 3
ECIV 220 | Mechanics of Solids | 3
ECIV 360 | Fluid Mechanics | 3
ELCT 101 | Electrical and Electronics Engineering | 1
ENCP 101 | Introduction to Engineering | 3
ENCP 102 | Introduction to Computer-Aided Design | 3

Total Credit Hours 42