MECHANICAL ENGINEERING, B.S.E.

Degree Requirements (125 hours)

See College of Engineering and Computing (https://academicbulletins.sc.edu/archives/2021-2022/undergraduate/engineering-computing/) for progression requirements and special academic opportunities.

Program of Study

<table>
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<th>Requirements</th>
<th>Credit Hours</th>
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<tr>
<td>1. Carolina Core</td>
<td>34-46</td>
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<tr>
<td>2. College Requirements</td>
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<td>3. Program Requirements</td>
<td>48</td>
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<td>4. Major Requirements</td>
<td>43</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 State 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/archives/2021-2022/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/archives/2021-2022/undergraduate/carolina-core-courses/)

GHS – Global Citizenship and Multicultural Understanding: Historical Thinking (3 hours)

- any CC-GHS course (https://academicbulletins.sc.edu/archives/2021-2022/undergraduate/carolina-core-courses/)

GSS – Global Citizenship and Multicultural Understanding: Social Sciences (3 hours)

- any CC-GSS course (https://academicbulletins.sc.edu/archives/2021-2022/undergraduate/carolina-core-courses/)

AIU – Aesthetic and Interpretive Understanding (3 hours)

- any CC-AIU course (https://academicbulletins.sc.edu/archives/2021-2022/undergraduate/carolina-core-courses/)

CMS – Effective, Engaged, and Persuasive Communication: Spoken Component (0-3 hours)

Select from the following:

- PHIL 325 (CMS/VSR overlay)
- any overlay or stand-alone CC-CMS course (https://academicbulletins.sc.edu/archives/2021-2022/undergraduate/carolina-core-courses/)

INF – Information Literacy (0-3 hours)

Select from the following:

- ENGL 102 (CMW/INF overlay)
- any overlay or stand-alone CC-INF course (https://academicbulletins.sc.edu/archives/2021-2022/undergraduate/carolina-core-courses/)

VSR – Values, Ethics, and Social Responsibility (0-3 hours)

Select from the following:

- PHIL 325 (CMS/VSR overlay)
- any overlay or stand-alone CC-VSR course (https://academicbulletins.sc.edu/archives/2021-2022/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 206</td>
<td>Scientific Applications Programming</td>
<td>3</td>
</tr>
<tr>
<td>MATH 241</td>
<td>Vector Calculus</td>
<td>3</td>
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</tbody>
</table>
MATH 242  Elementary Differential Equations  3

Select Math/Science Elective  6
Any 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
or ENCP 101  Introduction to Engineering I  3
EMCH 111  Introduction to Computer-Aided Design  3
or ENCP 102  Introduction to Engineering II  3
EMCH 200  Statics (must be passed with a grade of C or higher)  3
or ENCP 200  Statics  3
EMCH 201  Introduction to Applied Numerical Methods  3
or ENCP 201  Introduction to Applied Numerical Methods  3
EMCH 260  Solid Mechanics  3
or ENCP 260  Introduction to the Mechanics of Solids  3
EMCH 290  Thermodynamics  3
or ENCP 290  Thermodynamic Fundamentals  3
ELCT 220  Electrical Engineering for Non-Majors  3
or ELCT 221  Circuits  3

Mechanical Engineering Electives
Select six hours of the following:  6
EMCH 308  Introduction to Finite Element Stress Analysis  3
EMCH 441  Automotive System Fundamentals  3
EMCH 460  Special Problems  3
EMCH 497  Design of Thermal Systems  3
Any EMCH course numbered 500 or higher  3

Total Credit Hours  42

4. Major Requirements (43 hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMCH 310</td>
<td>Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>or ENCP 210</td>
<td>Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>EMCH 332</td>
<td>Kinematics</td>
<td>3</td>
</tr>
<tr>
<td>EMCH 354</td>
<td>Heat Transfer</td>
<td>3</td>
</tr>
<tr>
<td>EMCH 360</td>
<td>Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>or ENCP 360</td>
<td>Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>EMCH 361</td>
<td>Laboratory I</td>
<td>3</td>
</tr>
<tr>
<td>EMCH 362</td>
<td>Laboratory II</td>
<td>3</td>
</tr>
<tr>
<td>EMCH 367</td>
<td>Controls</td>
<td>3</td>
</tr>
<tr>
<td>EMCH 368</td>
<td>Mechatronics</td>
<td>4</td>
</tr>
<tr>
<td>EMCH 371</td>
<td>Materials</td>
<td>3</td>
</tr>
<tr>
<td>EMCH 377</td>
<td>Manufacturing</td>
<td>3</td>
</tr>
<tr>
<td>EMCH 380</td>
<td>Project Management</td>
<td>3</td>
</tr>
<tr>
<td>EMCH 427</td>
<td>Design I</td>
<td>3</td>
</tr>
<tr>
<td>EMCH 428</td>
<td>Design II</td>
<td>3</td>
</tr>
</tbody>
</table>

Mechanical Design elective:
EMCH 327  Machine Design  3
or EMCH 394  Applied Thermodynamics  3

Total Credit Hours  43