MECHANICAL ENGINEERING, B.S.E.

Learning Outcomes

LO 1 - Complex Problems

an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

LO 2 - Design

an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors

LO 3 - Communication

an ability to communicate effectively with a range of audiences

LO 4 - Judgment

an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts

LO 5 - Teams

an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

LO 6 - Experiments

an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

LO 7 - Knowledge

an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Academic Standards

Program GPA

Program GPA requirement policies are described in the College of Engineering and Computing section of this bulletin. For the purpose of these policies, the following courses are used to determine the Program GPA for the Mechanical Engineering B.S.E. program: All Lower Division Engineering courses, all Mechanical Engineering Major courses, and all courses used to satisfy a Mechanical Engineering Elective.

Admissions

Entrance Requirements

Admission requirements and processes for freshman, transfer students, and former students seeking readmission are managed by the Office of Undergraduate Admissions (http://sc.edu/about/offices_and_divisions/undergraduate_admissions/).

Transfer applicants from regionally accredited colleges and universities must have a cumulative 2.75 GPA on a 4.00 scale to enter the College of Engineering and Computing. In addition, transfer applicants for the Aerospace Engineering, Biomedical Engineering, Chemical Engineering, Civil Engineering, Computer Engineering, Electrical Engineering, or Mechanical Engineering majors must also have completed a four semester-hour calculus course equivalent to MATH 141 with a grade of "C" or better.

Current University of South Carolina students who wish to enter the College of Engineering and Computing, and former students seeking readmission, must have an institutional GPA of 2.50 or better on at least 15 hours earned at UofSC. In addition, such applicants for the Aerospace Engineering, Biomedical Engineering, Chemical Engineering, Civil Engineering, Computer Engineering, Electrical Engineering, or Mechanical Engineering majors must also have completed a four semester-hour calculus course equivalent to MATH 141 with a grade of "C" or better.

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

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Carolina Core</td>
<td>34-46</td>
</tr>
<tr>
<td>2. College Requirements</td>
<td>0</td>
</tr>
<tr>
<td>3. Program Requirements</td>
<td>48</td>
</tr>
<tr>
<td>4. Major Requirements</td>
<td>43</td>
</tr>
</tbody>
</table>

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/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.
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
ECHE 101 Introduction to Chemical Engineering 2
ECHE 310 Introductory Chemical Engineering Thermodynamics 3
ECHE 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
BMEN 101 Introduction to Biomedical Engineering 1
ELCT 101 Electrical and Electronics Engineering 1

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></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>
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<tr>
<td>or ENCP 360</td>
<td>Fluid Mechanics</td>
<td></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>
<tr>
<td>Mechanical Design elective:</td>
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<tr>
<td>EMCH 327</td>
<td>Machine Design</td>
<td>3</td>
</tr>
<tr>
<td>or EMCH 394</td>
<td>Applied Thermodynamics</td>
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</tr>
</tbody>
</table>

Total Credit Hours 43

**Major Map**

A major map is a layout of required courses in a given program of study, including critical courses and suggested course sequences to ensure a clear path to graduation.

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.

Mechanical Engineering, B.S.E.