MECHANICAL ENGINEERING
Bachelor of Science in Mechanical Engineering

Mechanical Engineering is an engineering discipline that requires an understanding of mechanics, kinematics, thermodynamics and energy, and involves the application of principles of physics and mathematics to develop mechanical systems. The American Society of Mechanical Engineers (ASME) defines mechanical engineering as the branch of engineering that serves society through the analysis, design, and manufacture of systems that convert a source of energy to useful mechanical work. The Bachelor of Science in Mechanical Engineering (BSME) program emphasizes service, systems-based knowledge, and sustainability with an eye toward the interface of traditional mechanical engineering with new and emerging fields, in particular those fields in maritime sciences and marine biology that directly impact the Gulf Coast where the program is strategically located.

In accordance with the expectations of the accrediting organization ABET, the educational objectives of this program are to graduate students who will:

- Practice the mechanical engineering discipline successfully within community accepted standards
- Possess teamwork and communications skills to develop a successful career in mechanical engineering
- Fulfill professional and ethical responsibilities in the practice of mechanical engineering, including social, environmental and economic considerations
- Engage in professional service, such as participation in professional society and community service
- Engage in life-long learning activities, such as graduate studies or professional workshops, and
- Develop a professional career in the prevailing market that meets personal goals, objectives and desires.

Graduates will have the ability to work professionally and ethically, as individuals and in multi-disciplinary teams, in both the thermal and mechanical systems areas, including the design, manufacture, and control of such systems. Students will develop a deep understanding of the impact of engineering solutions from a global, financial, environmental, societal, political, ethical, health and safety, and sustainability perspective.

Student Learning Outcomes:

- Apply knowledge of mathematics, science, and engineering in discerning methods.
- Design, perform, and analyze experiments for thermo-fluid and mechanical systems.
- Design thermo-fluid, energy, mechanical and control systems to meet specifications within environmental, safety, and manufacturability constraints.
- Participate effectively in teams involving multi-disciplines.
- Identify, formulate, and solve thermo-fluid, and mechanical systems problems by applying engineering principles.
- Develop practical solutions for mechanical engineering problems with professional and
ethical responsibility.

- Communicate effectively with written or oral presentations using modern visual means in a technical setting.
- Understand contemporary issues in engineering.
- Understand the impact of engineering in a global, economic, environmental, and societal context.
- Be prepared for a lifelong pursuit of continuing education.
- Have an ability to use modern engineering techniques and computing tools necessary for engineering practice.

Degree Requirements

The mechanical engineering curriculum consists of a minimum of 129 credit hours and can be divided into four main areas: University Core requirements, mathematics and science requirements, engineering requirements, and technical electives.

Because courses in mechanical engineering tend to be sequential, it is very important that students have the proper prerequisites. When in doubt, students should check with their faculty mentor.

A summary of the hours necessary for graduation follows:

<table>
<thead>
<tr>
<th></th>
<th>Sem. Hrs.</th>
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</thead>
<tbody>
<tr>
<td>I. University Core Curriculum and other General Education Requirements</td>
<td>45</td>
</tr>
<tr>
<td>University Core Curriculum Program</td>
<td>45</td>
</tr>
<tr>
<td>First-Year Seminars (when applicable)*</td>
<td>(2)</td>
</tr>
<tr>
<td>II. Common Engineering and Math courses</td>
<td>46</td>
</tr>
<tr>
<td>III. Common Mechanical Engineering courses</td>
<td>26</td>
</tr>
<tr>
<td>IV. Technical Elective Block</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>129 (131)</td>
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*First Year Seminars

First-Year Seminars or Electives

Full-time, first-year students are required to take the following courses:

UCCP 1101/UCCP 1102 First-Year Seminar I, II 2

The specific requirements for each aspect of the Bachelor of Science in Mechanical Engineering degree are indicated on the following pages.

I. University Core Curriculum and other General Education Requirements

See “University Core Curriculum Program” in this catalog. Mechanical engineering students should take the following courses in fulfillment of the mathematics and natural science components of the University Core Curriculum:

- MATH 2413 Calculus I (lecture component) 3
- PHYS 2425 University Physics I (lecture component) 3
- PHYS 2426 University Physics II (lecture component) 3

Mechanical engineering students must take two courses in physics even if the natural science portion of the core curriculum is satisfied by other means. Students transferring to A&M-Corpus Christi from other institutions may have various means for fulfilling the core
II. Common Engineering, Math and Science Courses

- MATH 2413 Calculus I (laboratory component) 1
- PHYS 2425 University Physics I (laboratory component) 1
- PHYS 2426 University Physics II (laboratory component) 1
- MATH 2414 Calculus II 4
- MATH 3470 Calculus III 4
- MATH 3315 Differential Equations 3
- ENGR 1211 Foundations of Engineering I 2
- ENGR 1212 Foundations of Engineering II 2
- ENGR 1215 CO-OP 2
- ENGR 2316 Thermodynamics 3
- ENGR 2321 Statics and Dynamics 3
- ENGR 2322 Materials Science 3
- ENGR 2350 Manufacturing Processes 3
- ENGR 2360 Electrical Circuits 3
- ENGR 3315 Fluid Mechanics 3
- CHEM 1311 General Chemistry I 3
- CHEM 1111 General Chemistry Lab I 1
- COSC 1435 Introduction to Problem Solving with Computers 4
- Total 46

III. Common Mechanical Engineering Courses

- MEEN 3310 Engineering Analysis for Mechanical Engineering 3
- MEEN 3312 Dynamics and Vibrations 3
- MEEN 3330 Solid Mechanics for Mechanical Engineering 3
- MEEN 3340 Solid Modeling and Finite Elements 3
- MEEN 3345 Heat Transfer 3
- MEEN 4220 Engineering Lab 2
- MEEN 4320 Machine Design 3
- MEEN 4340 Project Management 3
- MEEN 4370 Capstone Projects 3
- Total 26

IV. Technical Elective Block (select four courses from the following list)

These electives provide students the option to take courses that apply to their field of interest or to the Coastal Bend region. Many of the electives address issues related to ships, offshore platforms, offshore wind turbines, and sea floor mapping.

Students choose one of these two courses:
- MEEN 4360 Thermal System Design 3
- MEEN 4365 Mechanical System Design 3

And choose three of the following courses:
- MEEN 4350 Controls, Automation and Robotics 3
MEEN 4355  Marine Fabrication  3
MEEN 4380  Renewable Energy  3
MEEN 4385  Offshore Energy Management  3
MEEN 4390  Introduction to Computational Fluid Mechanics  3
MEEN 4395  Offshore Water Exploration and Desalination  3
MEEN 4325  Energy Conversion  3

Schedule Options
Students may choose either a fast-track option that may be finished in four-years or a five-year option involving a cooperative educational experience in the latter part of their studies. Students pursuing the cooperative educational approach will have periodic full-time work experiences in their areas of interest with participating industries and businesses.

Co-Ops
Students will form relationships with local engineers through field experiences, internships, and co-ops. All students will have a co-op experience during their freshmen year. Students in the cooperative educational option will pursue additional co-op experiences during the summer and fall semesters beginning in the sophomore year. All field experiences will conclude with an exit interview of both the student participant and the student’s immediate supervisor of the project.

Capstone Project
All mechanical engineering students must complete a senior-level capstone project in MEEN 4370. Students will work with practicing engineers and mechanical engineering faculty who will incorporate research projects from Harte Research Institute and Conrad Blucher Institute for Surveying and Science into the capstone projects. The capstone project will give engineering students practical, professional experience to prepare them for careers in mechanical engineering.

CONTACT INFORMATION
Mechanical Engineering, Texas A&M University-Corpus Christi, Corpus Christi, TX 78412. Web: http://entc.tamucc.edu/.

UNDERGRADUATE COURSES
All course descriptions are located in one section near the back of the catalog.