Doctor Of Philosophy (Ph.D.) In Biomedical Engineering/ Basic Medical Sciences

Degree Requirements

Students may pursue a doctorate in Biomedical Engineering through the Interdisciplinary Graduate Program in Basic Medical Sciences. This program is offered in collaboration with faculty of the USA College of Medicine. The program combines an interdisciplinary core curriculum with advanced coursework and research in biomedical engineering.

Students must meet requirements established for the Basic Medical Sciences graduate program in the College of Medicine. Prospective students should contact Dr. Silas Leavesley, Director, Biomedical Engineering Graduate Program.

Department Information

<table>
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<tr>
<th>Department of Mechanical Engineering</th>
<th>(251) 460-6168</th>
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<tr>
<td>Chair</td>
<td>David A. Nelson</td>
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<td>Professors</td>
<td>Hsiao, Nelson, Phan</td>
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<td>Associate Professors</td>
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<td>Assistant Professors</td>
<td>Kar, Kim, Montalvo, Poole, Richardson, Tambe, Yazdani</td>
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<td>Professors Emeritus</td>
<td>Donovan, Engin</td>
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<td>Instructors</td>
<td>Northington, Kramer, Roberts</td>
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Department of Mechanical Engineering web site
http://www.southalabama.edu/colleges/engineering/me/index.html

Mechanical Engineering is one of the broadest engineering disciplines. Mechanical engineers invent, analyze and design systems that produce power or convert energy. This encompasses such diverse applications as designing next-generation aircraft and automobiles, inventing novel methods of generating energy from renewable sources, and developing sophisticated new medical devices and systems. Mechanical engineers are in the forefront of exciting new technological fields, including nano-engineering, biomedical engineering, and energy research.

The basic fields of study for mechanical engineers include:

- Materials science, which is the study of the relationship between structure, properties, and processing of materials.
- Thermodynamics and heat transfer deal with basic concepts and applications of work, energy, and power. Applications include power generation from fossil fuels, from renewable sources (solar, wind energy) and fuel cells.
- Engineering mechanics is the study of static and dynamic effects of forces applied to rigid and flexible solid bodies.
- Fluid mechanics, the study of the forces and motions of liquids and gases. Included in this area of study are hydraulics, gas dynamics, aerodynamics, and design and application of pumps, compressors, and turbines.
- Control systems including studies of transient and steady-state response of systems to external inputs.
- Design synthesis which integrates all fields of engineering in the production of safe, practical, efficient, and economically feasible solutions to real problems.

All BSME students complete a senior-year "capstone" design project, in which a team of students defines and solves a unique, real-world engineering problem.

The curriculum leading to the Bachelor of Science in Mechanical Engineering (BSME) is designed so that graduates can work in any Mechanical Engineering field, or continue their educations at the graduate level.
BSME Program Educational Objectives:
Alumni of the Bachelor of Science in Mechanical Engineering (BSME) program should demonstrate the following traits and accomplishments within five years following graduation:

1. Graduates will achieve professional advancements or promotions with progressively higher levels of responsibility, competency, professional and ethical judgment and analysis. They will apply creative and innovative techniques to solve significant problems. They will apply team assimilation skills to successfully manage cross-disciplinary, collaborative projects that require global and multicultural perspectives.

2. Graduates will demonstrate effective written and oral communication skills in presenting, documenting and conveying their work. They will use these skills in creating and supporting new or improved designs, inventions, and intellectual property, thereby contributing to the social, economic, and environmental well-being of local and global communications.

3. Graduates will demonstrate commitment to lifelong and continuous professional development through activities such as mentoring, participating in professional societies, completing advanced degrees and achieving professional registration or other certifications.

Mechanical Engineering graduates will accomplish these objectives in the course of professional employment, entrepreneurship, military or public service and postgraduate education.

BSME Student Outcomes:
By the time of graduation from the BSME program, a student will have demonstrated attainment of the following outcomes:

a. An ability to apply knowledge of mathematics, science, and engineering.

b. An ability to design and conduct experiments, as well as to analyze and interpret data.

c. An ability to design a system, component or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.

d. An ability to function on multidisciplinary teams.

e. An ability to identify, formulate, and solve engineering problems.

f. An understanding of professional and ethical responsibility.

g. An ability to communicate effectively.

h. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.

i. A recognition of the need for, and an ability to engage in life-long learning.

j. A knowledge of contemporary issues.

k. An ability to use techniques, skills, and modern engineering tools necessary engineering practice.

The BSME curriculum is designed to ensure the attainment of the student outcomes.

The Bachelor of Science in Mechanical Engineering program is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org.

Exam-Complaint Calculator Policy

Every Mechanical Engineering (ME) student must have an exam-compliant calculator for use in those ME courses which allow calculator usage. Only those calculators which are acceptable for use in the Fundamentals of Engineering (FE) exam are considered to be exam-compliant and may be used in those Mechanical Engineering classes which allow calculator usage. Use of a calculator which is NOT exam complaint in an ME test, quiz, or exam will be considered to be in academic misconduct. For a list of exam-complaint calculator models, see http://ncees.org.exams.calculator/.