

Mechanical Engineering (BS)

Degree Requirements

First Year		Credit Hours
Fall		16
EH 101	3 hrs	
MA 125	4 hrs	
CH 131	4 hrs	
EG 101	2 hrs	
Gen Ed*	3 hrs	
Spring		17
EH 102	3 hrs	
MA 126	4 hrs	
PH 201	4 hrs	
CA 110	3 hrs	
ME 135	3 hrs	
Second Year		Credit Hours
Fall		17
MA 227	4 hrs	
MA 237	3 hrs	
PH 202	4 hrs	
EG 283	3 hrs	
Gen Ed*	3 hrs	
Spring		15
MA 238	3 hrs	
EG 220	3 hrs	
EG 231	3 hrs	
EG 284	3 hrs	
EG 315	3 hrs	
Third Year		Credit Hours
Fall		16
EG 270	3 hrs	
EG 360	3 hrs	
ME 326	3 hrs	

ME 328	4 hrs	
Science Elective+	3 hrs	
Spring		16
ME 312	3 hrs	
ME 314	3 hrs	
ME 316	3 hrs	
ME 317	3 hrs	
ME 336	1 hr	
Gen Ed	3 hrs	
Fourth Year*****		
		Credit Hours
Fall		14
ME 412	1 hr	
ME 410	3 hrs	
ME 426	3 hrs	
ME 429	1 hr	
Gen Ed	3 hrs	
ME Elective**	3 hrs	
Spring		15
ME 414	1 hr	
ME 416	2 hr	
ME 472	3 hrs	
ME Elective or Technical Elective	3 hrs	
ME Elective or Technical Elective	3 hrs	
Gen Ed*	3 hrs	

General education requirements consist of nine (9) credit hours in Humanities and nine (9) credit hours in Social Sciences. Humanities credits must include one approved literature course, one approved fine arts course, and CA 110 (Public Speaking). Social Sciences credits must include one approved history course, one approved social and behavioral science course, and one course from either history or social and behavioral sciences.

*Select from the list of approved science electives

*Select from the list of approved technical electives

**Select from the list of approved Mechanical Engineering electives

Professional Component Standing (PCS)

It is important that students make adequate progress in the Mechanical Engineering program. Satisfactory completion of a set of fundamental courses is required before a student is allowed to take advanced courses. Professional Component Standing

(PCS) is awarded by the chair of the department when the student completes the College of Engineering PCS requirements and the ECE departmental PCS requirements.

Mechanical Engineering PCS Courses			
Course Number	Course Title	Credit Hours	Minimum Grade
MA 227	Calculus III	3	C
MA 237	Linear Algebra I	3	C
PH 202	Calculus-Based Physics II + Lab	4	C
EG 283	Statics	3	C
ME 135	Engr Graphics and Comm	3	C

College of Engineering PCS Courses			
Course Number	Course Title	Credit Hours	Minimum Grade
EH 101	English Composition I	3	C
EH 102	English Composition II	3	C
CH 131	General Chemistry I + Lab	4	C
MA 125	Calculus I	4	C
MA 126	Calculus II	4	C
PH 201	Calculus-Based Physics I + Lab	4	C

Students who fail to maintain at least a 2.00 GPA overall at the University of South Alabama will lose PCS and may be required to take or repeat appropriate courses as specified by the department chair to correct their deficiencies and may not be permitted to continue in 300- and 400-level engineering courses.

Major Milestones

MECHANICAL ENGINEERING SAMPLE 4-YEAR PLAN WITH MILESTONES

Term 1	Course Description	Pre-req	Cr Hrs	Milestone Notes
EH 101*	English Composition I		3	Must complete at least 12 hours with a 2.0 or higher GPA
MA 125	Calculus I	ACT Math 27	4	
CH 131/131L	General Chemistry I	ACT Math 24	4	
EG 101	Freshman Seminar	ACT Math 24	2	
Fine Arts Elective			3	

16

Term 2	Course Description	Pre-req	Cr Hrs	Milestone Notes
EH 102	English Composition II	EH 101 or test score	3	MA 125
MA 126	Calculus II	MA 125	4	CH 131/131L
PH 201/201L	Physics I	MA 125 and MA 126 (cc)	4	EH 101 or EH 105*
ME 135	Engineering Graphics and Communication	MA 125 (cc)	3	
History (US or Western Civ.)			3	

17

Term 3	Course Description	Pre-req	Cr Hrs	Milestone Notes
MA 227	Calculus III	MA 126	4	PH 201/201L
MA 237	Linear Algebra I	MA 126	3	MA 126
PH 202/202L	Physics II	PH 201	4	EH 102
EG 283	Statics	MA 126 and PH 201	3	ME 135
CA 110			3	

17

Term 4	Course Description	Pre-req	Cr Hrs	Milestone Notes
MA 238	Differential Equations	MA 227 (cc)	3	MA 227
EG 284	Dynamics	EG 283	3	PH 202/202L
EG 315	Mechanics of Materials	EG 283 and MA 227	3	EG 283
EG 231	Engineering Economics and Ethics	EG 283	3	MA 237
EG 220	Electrical Circuits	PH 202	3	

15

Term 5	Course Description	Pre-req	Cr Hrs	Milestone Notes
EG 360	Fluid Mechanics	EG 284 and MA 238	3	MA 238
ME 326	Materials Science	EG 315	3	

Science Elective	See advisor for approved course list		3	
EG 270	Thermodynamics	PH 201 and MA 126	3	
ME 328	Mechanical Analysis II	MA 227 and MA 238	4	
			16	

Term 6	Course Description	Pre-req	Cr Hrs	Milestone Notes
ME 317	Heat Transfer	EG 270, EG 360, and ME 328	3	Apply for graduation
ME 336 (W)	Materials Science Lab	ME 326	1	Apply for FE Exam
ME 314	Machine Component Design	EG 284 and EG 315	3	
ME 312	ME Thermodynamics	EG 270	3	
ME 316	Instrumentation and Experimental Method	MA 238 and EG 220	3	
English Literature			3	
			16	

Term 7	Course Description	Pre-req	Cr Hrs	Milestone Notes
ME 410 (W)	Principles of Design	ME 314	3	FE Exam
ME 429	Controls and Instrumentation Lab		1	
ME 426	Controls	ME 316	3	
ME 412	Thermodynamics Lab	ME 316	1	
ME Elective	See advisor for approved course list		3	
Social/ Behavioral Elective			3	
			14	

Term 8	Course Description	Pre-req	Cr Hrs	Milestone Notes
ME 414	Capstone Design	ME 410	1	
ME 416	Capstone Project	ME 410	2	
ME Elective or Technical Elective	See advisor for approved course list		3	

ME Elective or Technical Elective	See advisor for approved course list		3
ME 472	Vibrations	EG 284, EG 315, and ME 316	3
Social/ Behavioral Elective			3
			15
		**TOTAL	126

All bolded courses meet general education requirements.

Courses listed as Milestones are required to obtain the Professional Component Standing (PCS).

Prerequisite courses denoted (cc) may be taken concurrently.

*Students who earn an English ACT score of 27, or a written SAT score of 610, can opt out of EH 101.

**Students not Term 1 - Calculus I ready will exceed the 126 hours required for this degree. If math is not started prior to Fall -Year 1, you are likely extending your four-year graduation time table. Students with ACT Math scores 21 and below should begin math courses in the summer before Fall - Year 1.

Two designated writing (W) courses are required with at least one course chosen from offerings in the student's major or minor. Courses carrying this required credit are identified in the University Bulletin by a (W) after the course title.

The Sample 4-year plan is designed as a guide for students preparing for their course selections. This information provides only a suggested schedule. Actual course selections should be made in consultation with an advisor.

Department Information

Department of Mechanical Engineering	(251) 460-6168
Chair	David A. Nelson
Professors	Hsiao, Nelson, Phan
Associate Professors	Cauley, Yazdani
Assistant Professors	Kar, Kim, Lillian, Montalvo, Poole, Richardson, Tambe, Dizbay-Onat
Professors Emeritus	Donovan, Engin
Instructors	Kramer, Roberts

Department of Mechanical Engineering website
<https://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:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. 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, and environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. 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
5. 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
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

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

BSME Accelerated Bachelors – Masters Degree Option

Qualified students may have the opportunity to apply a limited number of graduate course credits to the BSME degree and to the MSME degree. Students interested in this option should consult their ME advisor.

Exam-Compliant 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 compliant in an ME test, quiz, or exam will be considered academic misconduct. For a list of exam-compliant calculator models, see <http://ncees.org/exams/calculator/>.

Aerospace Engineering Track

Students who plan to enter careers or graduate studies in aerospace, aeronautics, astronautics, or a related field may pursue the specialized track in Aerospace Engineering with the BSME program. Students in this track must complete AE 361 Introduction to Aerodynamics, in addition to two other approved aerospace engineering electives.

Students interested in the Aerospace Engineering track within the BSME program should consult their academic advisor.

Biomedical Engineering Track

Students who plan to enter careers or graduate studies in biomedical engineering may pursue the specialized track in Biomedical Engineering within the BSME program. This track may also be appropriate for students planning to pursue a career in the health sciences (medical school, dental school, or other health profession programs).

Students in the Biomedical Engineering track must complete General Biology I & II w/ labs (BL 121, 121L, 122, 122L), General Chemistry II w/ lab (CH 132, 132L) and Me 467, Introduction to Biomedical Engineering.

Students interested in the Biomedical Engineering track within the BSME program should consult their academic advisor.

Students planning to apply for a health profession program should also consult with a Pre-Health Profession Advisor to identify any additional courses that may be required.