

# B.S. IN MECHANICAL ENGINEERING

<http://www.coe.miami.edu/dept-mac/>

## Curriculum Requirements

Code	Title	Credit Hours
<b>Engineering Courses</b>		
CAE 210	Mechanics of Solids I	3
ECE 205	Principles of Electrical Engineering-I	3
IEN 311	Applied Probability and Statistics	3
MAE 111	Introduction to Engineering I	3
MAE 112	Introduction to Engineering II	2
MAE 202	Dynamics	3
MAE 207	Mechanics of Solids II	3
MAE 241	Measurements Laboratory	3
MAE 301	Engineering Materials Science	3
MAE 302	Mechanical Behavior of Materials	3
MAE 303	Thermodynamics	3
MAE 309	Fluid Mechanics	3
MAE 310	Heat Transfer	3
MAE 341	Mechanical Design I	3
MAE 342	Mechanical Design II	3
MAE 351	Mechanics Laboratory	2
MAE 362	Computer Analysis of Mechanical and Aerospace Engineering Problems	3
MAE 404	Experimental Engineering Laboratory	2
MAE 412	System Dynamics	3
MAE 415	Automatic Control	3
MAE 440	Introduction to Capstone Design	3
MAE 441	Design of Fluid and Thermal Systems	3
MAE 442	Capstone Design Project-I	1
MAE 443	Capstone Design Project-II	2
MAE Technical Electives		6
Technical Elective		3
<b>Math and Science Courses</b>		
MTH 151	Calculus I for Engineers	5
MTH 162	Calculus II	4
MTH 211	Calculus III	3
MTH 311	Introduction to Ordinary Differential Equations	3
CHM 151	Chemistry for Engineers	3
CHM 153	Chemistry Laboratory for Engineers	1
PHY 221	University Physics I	3
PHY 222	University Physics II	3
PHY 223	University Physics III	3
PHY 224	University Physics II Lab	1
PHY 225	University Physics III Lab	1
<b>Additional Requirements</b>		
ENG 105	English Composition I	3
ENG 107	English Composition II: Science and Technology	3
Arts and Humanities Cognate		9

People and Society Cognate	9
Total Credit Hours	129

## Plan of Study

Freshman Year		Credit Hours
<b>Fall</b>		
MAE 111	Introduction to Engineering I	3
ENG 105	English Composition I	3
MTH 151	Calculus I for Engineers	5
PHY 221	University Physics I	3
	Credit Hours	14
<b>Spring</b>		
MAE 112	Introduction to Engineering II	2
CAE 210	Mechanics of Solids I	3
ENG 107	English Composition II: Science and Technology	3
MTH 162	Calculus II	4
PHY 222	University Physics II	3
PHY 224	University Physics II Lab	1
	Credit Hours	16
<b>Sophomore Year</b>		
<b>Fall</b>		
MAE 207	Mechanics of Solids II	3
IEN 311	Applied Probability and Statistics	3
MTH 211	Calculus III	3
PHY 223	University Physics III	3
PHY 225	University Physics III Lab	1
PS Cognate (PS Elective) <sup>1</sup>		3
	Credit Hours	16
<b>Spring</b>		
MAE 202	Dynamics	3
MAE 241	Measurements Laboratory	3
ECE 205	Principles of Electrical Engineering-I	3
CHM 151	Chemistry for Engineers	3
CHM 153	Chemistry Laboratory for Engineers	1
HA Cognate (HA Elective) <sup>1</sup>		3
	Credit Hours	16
<b>Junior Year</b>		
<b>Fall</b>		
MAE 302	Mechanical Behavior of Materials	3
MAE 303	Thermodynamics	3
MAE 309	Fluid Mechanics	3
MAE 341	Mechanical Design I	3
MTH 311	Introduction to Ordinary Differential Equations	3
PS Cognate (PS Elective) <sup>1</sup>		3
	Credit Hours	18
<b>Spring</b>		
MAE 301	Engineering Materials Science	3
MAE 310	Heat Transfer	3
MAE 342	Mechanical Design II	3
MAE 351	Mechanics Laboratory	2.00
MAE 362	Computer Analysis of Mechanical and Aerospace Engineering Problems	3

MAE 440	Introduction to Capstone Design	3
	Credit Hours	17
<b>Senior Year</b>		
<b>Fall</b>		
MAE 404	Experimental Engineering Laboratory	2.00
MAE 412	System Dynamics	3
MAE 441	Design of Fluid and Thermal Systems	3
MAE 442	Capstone Design Project-I	1
Technical Elective <sup>2</sup>		3
PS Cognate <sup>1</sup>		3
HA Cognate <sup>1</sup>		3
	Credit Hours	18
<b>Spring</b>		
MAE 443	Capstone Design Project-II	2
MAE 415	Automatic Control	3
MAE Technical Elective <sup>2</sup>		6
HA Cognate (Adv. HA Elective) <sup>1</sup>		3
	Credit Hours	14
	Total Credit Hours	129

<sup>1</sup> You must complete a minimum of 1 PS cognate and 1 HA cognate to be selected from the list of available cognates. Each cognate should be a minimum of 3 courses (9 credits).

<sup>2</sup> Technical electives are advanced courses in mathematics, science or engineering, approved by the Faculty Advisor, as appropriate for individual objectives.

## Mission

The mission of the Department of Mechanical and Aerospace Engineering is to provide excellent undergraduate education in aerospace engineering and undergraduate and graduate education in mechanical engineering that will prepare graduates to meet Society's changing needs and aspirations.

The mission of the Mechanical Engineering program is to provide excellent undergraduate education in Mechanical Engineering that will prepare graduates to meet society's changing needs and aspirations.

## Goals

The educational objectives of the undergraduate Mechanical Engineering (B.S.M.E.) Program are to prepare graduates, within a few years after graduation, to be:

- working as a professional or as an entrepreneur in an area related to mechanical engineering, and/or
- exhibiting lifelong learning by pursuing or having completed a graduate or professional degree and/or demonstrated professional development.

## Student Learning 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, 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.