

B.S. IN AEROSPACE ENGINEERING

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

Overview

The University of Miami Department of Mechanical and Aerospace Engineering offers a B.S. in Aerospace Engineering

Curriculum Requirements

| Code | Title | Credit Hours |
|---|--|--------------|
| Engineering Courses | | |
| CAE 210 | Mechanics of Solids I | 3 |
| ECE 205 | Principles of Electrical Engineering-I | 3 |
| EGN 123 | Computing and Digital Solutions for the future | 3 |
| or EGN 110 | Innovation and Entrepreneurship in Engineering | |
| or EGN 114 | Global Challenges Addressed by Engineering and Technology | |
| MAE 112 | Introduction to Engineering II | 2 |
| MAE 202 | Dynamics | 3 |
| MAE 207 | Mechanics of Solids II | 3 |
| MAE 241 | Measurements Laboratory | 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 351 | Mechanics Laboratory | 2 |
| MAE 362 | Computer Analysis of Mechanical and Aerospace Engineering Problems | 3 |
| MAE 371 | Aerodynamics | 3 |
| MAE 404 | Experimental Engineering Laboratory | 2 |
| MAE 415 | Automatic Control | 3 |
| MAE 444 | Capstone Aerospace Design Project-I | 3 |
| MAE 445 | Capstone Aerospace Design Project-II | 3 |
| MAE 446 | Aircraft Design | 3 |
| MAE 470 | Introduction to Aerospace Structures | 3 |
| MAE 471 | Flight Dynamics | 3 |
| MAE 472 | Design of Aerospace Structures | 3 |
| MAE 473 | Aerospace Propulsion | 3 |
| MAE Technical Elective (a MAE course at the 300-level) ² | | 3 |
| Math and Science Courses | | |
| ISE 311 | Applied Probability and Statistics | 3 |
| 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 106 | Physics Laboratory 1 | 1 |
| PHY 108 | Physics Laboratory 2 | 1 |
| General Education Requirements | | |

| | | |
|--|--|------------|
| Written Communication Skills: | | |
| WRS 105 | First-Year Writing I | 3 |
| WRS 107 | First-Year Writing II: STEM | 3 |
| Quantitative Skills: | | |
| MTH 151 | Calculus I for Engineers (fulfilled through the major) | |
| Areas of Knowledge: | | |
| Arts and Humanities Cognate ¹ | | 9 |
| People and Society Cognate ¹ | | 9 |
| STEM Cognate (9 credits) (fulfilled through the major) | | |
| Total Credit Hours | | 129 |

¹ You must complete a minimum of 1PS cognate and 1HA cognate to be selected from the Cognate Search Engine. Each cognate should be a minimum of three courses (9credits).

² MAE Technical Electives are courses 300 level in MAE.

Plan of Study

| | | |
|---------------------------------------|---|---------------------|
| Freshman Year | | |
| Fall | | Credit Hours |
| WRS 105 | First-Year Writing I | 3 |
| EGN 123, 110, or 114 | Computing and Digital Solutions for the future or Innovation and Entrepreneurship in Engineering or Global Challenges Addressed by Engineering and Technology | 3 |
| MTH 151 | Calculus I for Engineers | 5 |
| PHY 221 | University Physics I | 3 |
| Credit Hours | | 14 |
| Spring | | |
| MAE 112 | Introduction to Engineering II | 2 |
| CAE 210 | Mechanics of Solids I | 3 |
| WRS 107 | First-Year Writing II: STEM | 3 |
| MTH 162 | Calculus II | 4 |
| PHY 222 | University Physics II | 3 |
| PHY 106 | Physics Laboratory 1 | 1 |
| Credit Hours | | 16 |
| Sophomore Year | | |
| Fall | | |
| MAE 207 | Mechanics of Solids II | 3 |
| ISE 311 | Applied Probability and Statistics | 3 |
| MTH 211 | Calculus III | 3 |
| PHY 223 | University Physics III | 3 |
| PHY 108 | Physics Laboratory 2 | 1 |
| HA Cognate (HA Elective) ¹ | | 3 |
| Credit Hours | | 16 |
| Spring | | |
| MAE 202 | Dynamics | 3 |
| MAE 241 | Measurements Laboratory | 3 |
| CHM 151 | Chemistry for Engineers | 3 |
| CHM 153 | Chemistry Laboratory for Engineers | 1 |
| MTH 311 | Introduction to Ordinary Differential Equations | 3 |
| PS Cognate (PS Elective) ¹ | | 3 |
| Credit Hours | | 16 |

| | | | |
|---------------------------------------|--|--|------------|
| Junior Year | | | |
| Fall | | | |
| MAE 302 | Mechanical Behavior of Materials | | 3 |
| MAE 303 | Thermodynamics | | 3 |
| MAE 309 | Fluid Mechanics | | 3 |
| MAE 341 | Mechanical Design I | | 3 |
| HA Cognate (HA Elective) ¹ | | | 3 |
| ECE 205 | Principles of Electrical Engineering-I | | 3 |
| Credit Hours | | | 18 |
| Spring | | | |
| MAE 310 | Heat Transfer | | 3 |
| MAE 351 | Mechanics Laboratory | | 2 |
| MAE 362 | Computer Analysis of Mechanical and Aerospace Engineering Problems | | 3 |
| MAE 371 | Aerodynamics | | 3 |
| MAE 470 | Introduction to Aerospace Structures | | 3 |
| PS Cognate (PS Elective) ¹ | | | 3 |
| Credit Hours | | | 17 |
| Senior Year | | | |
| Fall | | | |
| MAE 404 | Experimental Engineering Laboratory | | 2 |
| MAE 444 | Capstone Aerospace Design Project-I | | 3 |
| MAE 446 | Aircraft Design | | 3 |
| MAE 471 | Flight Dynamics | | 3 |
| MAE 472 | Design of Aerospace Structures | | 3 |
| MAE 473 | Aerospace Propulsion | | 3 |
| Credit Hours | | | 17 |
| Spring | | | |
| MAE 415 | Automatic Control | | 3 |
| MAE 445 | Capstone Aerospace Design Project-II | | 3 |
| MAE Technical Electives ² | | | 3 |
| HA Cognate (HA Elective) ¹ | | | 3 |
| PS Cognate (PS Elective) ¹ | | | 3 |
| Credit Hours | | | 15 |
| Total Credit Hours | | | 129 |

¹ You must complete a minimum of 1 PS cognate and 1 AH cognate to be selected from the Cognate Search Engine. Each cognate should be a minimum of three courses (9 credit hours).

² MAE Technical Electives are courses 300 level in MAE.

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 Aerospace Engineering program is to provide excellent undergraduate education in Aerospace Engineering that will prepare graduates to meet society's changing needs and aspirations.

Program Educational Objectives

The educational objectives of the undergraduate Aerospace Engineering (B.S.A.S.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 aerospace 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 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.