Overview

The five-year BS/MS program leads to both the B.S. degree and the M.S. degree in Mechanical Engineering in five years. The program is intended for exceptional students who are admitted to the graduate program in their junior year. Students applying for this program must have a grade point average of at least 3.0. The two degrees are awarded simultaneously when the combined requirements have been met for both degrees.

- Juniors who have maintained at least a 3.0 GPA have the option to apply for admission to the 5-year BS-MS in Mechanical Engineering program.
- Those who are accepted into this accelerated program must maintain at least a 3.0 GPA and a minimum of a 3.0 GPA for the final 30 credit hours.
- Up to 6 credit hours of Technical electives earned during the fourth year can be counted toward the 30 credit hours required for the MS degree.
- Students must be registered for a minimum of 12 undergraduate credit hours per semester in their fourth year.
- Students can register for a maximum of 6 graduate credit hours in each semester of their fourth year.
- If a student needs to withdraw from the BS/MS Mechanical Engineering program then all the requirements for the specific BS Concentration must be completed for graduation with the BS degree.

Admission Requirements

Juniors in the Mechanical and Aerospace Engineering department of the University of Miami who have maintained at least a 3.0 GPA may apply to the dual degree program.

Curriculum Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAE 210</td>
<td>Mechanics of Solids I</td>
<td>3</td>
</tr>
<tr>
<td>ECE 205</td>
<td>Principles of Electrical Engineering–I</td>
<td>3</td>
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<tr>
<td>ISE 311</td>
<td>Applied Probability and Statistics</td>
<td>3</td>
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<tr>
<td>EGN 123</td>
<td>Computing and Digital Solutions for the future (can also be EGN 110 or EGN 114)</td>
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<tr>
<td>MAE 112</td>
<td>Introduction to Engineering II</td>
<td>2</td>
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<td>MAE 202</td>
<td>Dynamics</td>
<td>3</td>
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<tr>
<td>MAE 207</td>
<td>Mechanics of Solids II</td>
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<tr>
<td>MAE 241</td>
<td>Measurements Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>MAE 301</td>
<td>Engineering Materials Science</td>
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<tr>
<td>MAE 302</td>
<td>Mechanical Behavior of Materials</td>
<td>3</td>
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<tr>
<td>MAE 303</td>
<td>Thermodynamics</td>
<td>3</td>
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<tr>
<td>MAE 309</td>
<td>Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>MAE 310</td>
<td>Heat Transfer</td>
<td>3</td>
</tr>
<tr>
<td>MAE 341</td>
<td>Mechanical Design I</td>
<td>3</td>
</tr>
<tr>
<td>MAE 342</td>
<td>Mechanical Design II</td>
<td>3</td>
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<tr>
<td>MAE 351</td>
<td>Mechanics Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>MAE 362</td>
<td>Computer Analysis of Mechanical and Aerospace Engineering Problems</td>
<td>3</td>
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<tr>
<td>MAE 404</td>
<td>Experimental Engineering Laboratory</td>
<td>2</td>
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<tr>
<td>MAE 412</td>
<td>System Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>MAE 415</td>
<td>Automatic Control</td>
<td>3</td>
</tr>
<tr>
<td>MAE 441</td>
<td>Design of Fluid and Thermal Systems</td>
<td>3</td>
</tr>
<tr>
<td>MAE 442</td>
<td>Capstone Design Project-I</td>
<td>3</td>
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<tr>
<td>MAE 443</td>
<td>Capstone Design Project-II</td>
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<td>Technical Elective</td>
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<tr>
<td>MTH 151</td>
<td>Calculus I for Engineers</td>
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<tr>
<td>MTH 162</td>
<td>Calculus II</td>
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<tr>
<td>MTH 211</td>
<td>Calculus III</td>
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</tbody>
</table>
### B.S./M.S. - Mechanical Engineering

**General Education Requirements**

**Written Communication Skills:**
- WRS 105 First-Year Writing I
  - 3 credit hours
- WRS 107 First-Year Writing II: STEM
  - 3 credit hours

**Quantitative Skills:**
- MTH 151 Calculus I for Engineers (fulfilled through the major)

**Areas of Knowledge:**
- Arts and Humanities Cognate
  - 9 credit hours
- People and Society Cognate
  - 9 credit hours
- STEM Cognate (9 credits) (fulfilled through the major)

**MS in Mechanical Engineering Requirements (30 Credit Hours)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAE 601</td>
<td>Methods of Engineering Analysis</td>
<td>3</td>
</tr>
<tr>
<td><strong>Graduate Level Courses</strong></td>
<td></td>
<td><strong>24</strong></td>
</tr>
<tr>
<td>MAE 751</td>
<td>Master's Project</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credit Hours</strong></td>
<td></td>
<td><strong>153</strong></td>
</tr>
</tbody>
</table>

### Plan of Study

#### Freshman Year

**Fall**
- EGN 123 Computing and Digital Solutions for the future (can also be EGN 110 or EGN 114)
  - 3 credit hours
- WRS 105 First-Year Writing I
  - 3 credit hours
- MTH 151 Calculus I for Engineers
  - 5 credit hours
- PHY 221 University Physics I
  - 3 credit hours

**Total Credit Hours**
- 14 credit hours

**Spring**
- MAE 112 Introduction to Engineering II
  - 2 credit hours
- CAE 210 Mechanics of Solids I
  - 3 credit hours
- WRS 107 First-Year Writing II: STEM
  - 3 credit hours
- MTH 162 Calculus II
  - 4 credit hours
- PHY 222 University Physics II
  - 3 credit hours
- PHY 224 University Physics II Lab
  - 1 credit hour

**Total Credit Hours**
- 16 credit hours

#### Sophomore Year

**Fall**
- MAE 207 Mechanics of Solids II
  - 3 credit hours
- ISE 311 Applied Probability and Statistics
  - 3 credit hours
- MTH 211 Calculus III
  - 3 credit hours
- PHY 223 University Physics III
  - 3 credit hours
- PHY 225 University Physics III Lab
  - 1 credit hour
- PS Cognate (PS Elective)
  - 3 credit hours

**Total Credit Hours**
- 16 credit hours

**Spring**
- MAE 202 Dynamics
  - 3 credit hours
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAE 241</td>
<td>Measurements Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>CHM 151</td>
<td>Chemistry for Engineers</td>
<td>3</td>
</tr>
<tr>
<td>CHM 153</td>
<td>Chemistry Laboratory for Engineers</td>
<td>1</td>
</tr>
<tr>
<td>ECE 205</td>
<td>Principles of Electrical Engineering–I</td>
<td>3</td>
</tr>
<tr>
<td>HA Cognate (HA Elective)</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credit Hours</strong></td>
<td></td>
<td>16</td>
</tr>
</tbody>
</table>

### 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)
- MTH 311: Introduction to Ordinary Differential Equations (3)
- HA Cognate (HA Elective) (3)

#### Spring
- MAE 301: Engineering Materials Science (3)
- MAE 310: Heat Transfer (3)
- MAE 342: Mechanical Design II (3)
- MAE 351: Mechanics Laboratory (2)
- MAE 362: Computer Analysis of Mechanical and Aerospace Engineering Problems (3)
- PS Cognate (PS Elective) (3)

#### Total Credit Hours
- 18

### Senior Year

#### Fall
- MAE 404: Experimental Engineering Laboratory (2)
- MAE 412: System Dynamics (3)
- MAE 441: Design of Fluid and Thermal Systems (3)
- Technical Elective (3)
- MAE 442: Capstone Design Project-I (3)
- Graduate Level Course (3)

#### Spring
- MAE 415: Automatic Control (3)
- MAE 443: Capstone Design Project-II (3)
- HA Cognate (HA Elective) (3)
- PS Cognate (Adv. PS Elective) (3)
- Graduate Level Course (3)

#### Total Credit Hours
- 17

### Fifth Year (Graduate)

#### Fall
- MAE 601: Methods of Engineering Analysis (3)
- Graduate Level Course (3)
- Graduate Level Course (3)
- Graduate Level Course (3)

#### Spring
- MAE 751: Master’s Project (3)
- Graduate Level Course (3)
- Graduate Level Course (3)

#### Total Credit Hours
- 12
B.S./M.S. - Mechanical Engineering

Graduate Level Course

<table>
<thead>
<tr>
<th>Credit Hours</th>
<th>Total Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>153</td>
</tr>
</tbody>
</table>

1. 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 three courses (9 credit hours).
2. Technical Electives are advanced courses in mathematics, science or engineering, approved by the Faculty Advisor, as appropriate for individual objectives.
3. At least two must be at 700 Level courses in mathematics, science or engineering, approved by the Faculty Advisor, as appropriate for individual objectives.