Department of Aerospace and Mechanical Engineering
MS—Mechanical Engineering

**General Requirements for Graduation Without Thesis** – 27 units total with 3.0 GPA overall:
- 4 units AME 525 Engineering Analysis
- 11 units 500 level courses in AME department
  - Cross listed classes (Ex: SAE 549, CE 507, MASC 551) count as AME department courses
- 12 units Approved 400 or 500 level elective courses
  - Elective courses may be from AME, Math, Physics, or other Engineering Departments
    (ASTE, BME, CE, CHE, CS, EE, ENE, ENGR, INF, ISE, ITP, MASC, PTE, SAE)
- No more than 3 classes (9 units) at 400 level
- Only 3 units of AME 590 Directed Research can be taken as elective credit

**Notes:** Term course typically offered is (F)=Fall  (Sp)= Spring   (Su)=Summer   + Not Regularly Offered
Ex: AME 436 Energy and Propulsion (Sp) is typically offered in the Spring.

**Recommended Courses by Specialization:** Note Specializations do not appear on transcripts or diplomas

### Advanced Manufacturing

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>AME 547</td>
<td>Foundations of Manufacturing Automation (F)</td>
</tr>
<tr>
<td>AME 546</td>
<td>Design for Manufacturing and Assembly</td>
</tr>
<tr>
<td>AME 554</td>
<td>Additive Manufacturing Technologies (F)</td>
</tr>
<tr>
<td>ISE 511 L</td>
<td>Mechatronics Systems Engineering</td>
</tr>
</tbody>
</table>

### Core Electives (2 or 3 courses = 8 units):

- 400-, 500- or 600-level graduate courses by advisement. Elective courses may be from AME, ISE, SAE, or CS. Up to 3 units of directed research, seminar, and/or internship may be taken as degree credit.

### Thermal and Fluid Sciences Track

#### Combustion Core Courses:
- AME 436 Energy and Propulsion (Sp)
- AME 513 Principles of Combustion (F)
- AME 514 Applications of Combustion and Reacting Flows (Sp)
- AME 530a Dynamics of Incompressible Fluids (Sp)

#### Fluid Dynamics Core Courses:
- AME 457 Engineering Fluid Dynamics (F)
- AME 511 Compressible Gas Dynamics (Sp)
- AME 530a Dynamics of Incompressible Flows (F)
- AME 535a Intro to Computational Fluid (F)

#### Heat Transfer Core Courses:
- AME 457 Engineering Fluid Dynamics (F)
- AME 515 Advanced Problems in Heat
- AME 516 Convective Processes (Sp) +
- AME 517 Radiation Heat Transfer (F) +

### Design Track

#### Design Core Courses:
- AME 503 Advanced Mechanical Design (F)(Su)
- AME 505 Engineering Information Modeling (Sp)
- AME 509 Applied Elasticity (Sp)

#### Recommended Electives:
- AME 404 Mechanical Engineering
- AME 451 Linear Controls Systems I (F)(Sp) □
- AME 527 Elements of Vehicle and Energy
- AME 541 Linear Control Systems II ^(F)
- ASTE 520 Spacecraft System Design (F)(Sp)
- ASTE 523 Design of Low Cost Space Missions
- CE 529a Finite Element Analysis (F)(Su)
- SAE 549 System Architecting (F)(Sp)(Su)

*AME 526 is recommended prep for AME 535a.*

^ AME 451 is pre-req for AME 541.
# Mechanics and Materials Track

**Mechanics and Materials Core Courses:**
- AME 509 Applied Elasticity (Sp)
- AME 560 Fatigue and Fracture (Sp)
- MASC 551 Mechanical Behavior of

**Recommended Electives:**
- AME 588 Materials Selection (F)
- AME 559 Creep (F)
- MASC 534 Materials Characterization (F)
- MASC 561 Dislocation Theory and Applications (Sp)

**Dynamics and Control Core Courses:**
- AME 521 Engineering Vibrations II (F)
- AME 522 Nonlinear Vibrations (F)
- AME 524 Advanced Engineering Dynamics (F)
- AME 541 Linear Control Systems II * (F)
- AME 542 Nonlinear Vibrations (F)

**Recommended Electives:**
- AME 420 Engineering Vibrations I (Sp)
- AME 544 Computer Control of Mechanical Systems (Sp)
- AME 451 Linear Control Systems I (F)

* AME 451 is pre-req for AME 541.  ^ AME 541 is pre-req for AME 552.

**Energy Track**

**Energy Core Courses:**
- AME 430 Thermal System Design (F)
- AME 577 Survey of Energy & Power for a Sustainable Future (Sp)
- AME 578 Modern Alternative Energy Conversion Devices (F)

**Recommended Electives:**
- AME 513 Principles of Combustion (F)
- AME 514 Applications of Combustion and Reacting Flows (Sp)
- AME 579 Combustion Chemistry and Physics
- AME 581 Intro to Nuclear Engineering (F)
- AME 582 Nuclear Reactor Physics (Sp)
- ENE 505 Energy and Environment (F)(Sp)

**Program of Study Worksheet**

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester</th>
<th>Notes</th>
</tr>
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<tbody>
<tr>
<td>AME 525</td>
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*To be approved to pursue the MSME with Thesis, you must first discuss with an AME Academic Advisor during your first semester in