## Master of Science in Mechanical and Aerospace Engineering with Specialization in Energy/Environment/Economics (E3)

**Master of Science in Mechanical and Aerospace Engineering with Specialization in Energy/Environment/Economics (E3) (Coursework Only Option)**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Credits Required</td>
<td>32</td>
</tr>
<tr>
<td>Maximum 400-Level Credit</td>
<td>9</td>
</tr>
<tr>
<td>Maximum 700-Level Credit</td>
<td>6</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>MMAE 501</td>
<td>Engineering Analysis I</td>
<td>3</td>
</tr>
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</table>

### Core Courses

**Engineering Analysis Courses**

- MMAE 501: Engineering Analysis I (3)

**Core Courses**

- CHE 543: Energy Envir Economics (3)

Select a minimum of three credit hours from the following:

- MMAE 451: Finite Elmnt Methods in Engrg (3)
- MMAE 517: Computational Fluid Dynamics (3)
- MMAE 532: Finite Element Methods II (3)
- MMAE 544: Design Optimization (3)
- MMAE 570: Computational Methods in MSE (3)

Select a minimum of one course from the following:

- CHE 503: Thermodynamics (3)
- CHE 553: Advanced Thermodynamics (3)
- MMAE 520: Advanced Thermodynamics (3)
- MMAE 525: Fundamentals of Heat Transfer (3)

Select a minimum of one course from the following:

- CHE 541: Renewable Energy Technologies (3)
- MMAE 522: Nuclear F-F & Sust Energy Sys (3)
- MMAE 523: Fundamentals Power Generation (3)
- MMAE 524: Fundamentals of Combustion (3)

**Non-Core Courses**

Select a minimum of one course from the following:

- MMAE 524: Fundamentals of Combustion (3)
- MMAE 525: Fundamentals of Heat Transfer (3)
- MMAE 526: Conduction and Diffusion (3)
- MMAE 527: Heat Trans Convection Radiatio (3)

Select a minimum of one course from the following:

- CHE 541: Renewable Energy Technologies (3)
- CHE/MMAE 560: Ststcl Qlty Process Control (3)
- ENVE 501: Environmental Chemistry (3)
- ENVE 506: Chemodynamics (3)
- ENVE 542: Physcheml Prcs in Envir Eng (3)
- ENVE 551: Industrial Waste Treatment (3)
- ENVE 561: Dsgn of Envrmtl Engr Prcs (3)
- ENVE 570: Air Pollution Meteorology (3)
- ENVE 577: Dsgn of Air Poltn Control Dvcs (3)
- ENVE 578: Phys&Chem Prcs Indus Gas Clng (3)
- ENVE 580: Hazardous Waste Engineering (3)
Elective Courses

Select a minimum of 11 credit hours of 400-level and above MMAE courses

Students may include up to six credit hours of MMAE 594 Project for Master of Engineering Students.

Master of Science in Mechanical and Aerospace Engineering with Specialization in Energy/Environment/Economics (E3) (Thesis Option)

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<td>MMAE 502</td>
<td>Engineering Analysis II</td>
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Engineering Analysis Courses

Select a minimum of three credit hours from the following:

- MMAE 451: Finite Elmnt Methods in Engrg
- MMAE 517: Computational Fluid Dynamics
- MMAE 532: Finite Element Methods II
- MMAE 544: Design Optimization
- MMAE 570: Computational Methods in MSE

Core Courses

Select a minimum of one course from the following:

- CHE 503: Thermodynamics
- CHE 553: Advanced Thermodynamics
- MMAE 520: Advanced Thermodynamics
- MMAE 525: Fundamentals of Heat Transfer

Non-Core Courses

Select a minimum of one course from the following:

- MMAE 524: Fundamentals of Combustion
- MMAE 525: Fundamentals of Heat Transfer
- MMAE 526: Conduction and Diffusion
- MMAE 527: Heat Trnsf Convection Radiatio
<table>
<thead>
<tr>
<th>Thesis Research</th>
<th>(6-8)</th>
</tr>
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<tbody>
<tr>
<td>MMAE 591</td>
<td>Research and Thesis M.S.</td>
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