# Bachelor of Science in Engineering (Mechanical Engineering)

**Total Credit Hours Required: 128**

**Student Name:**  
**Student Number:**

**Date of Entry into Program:**  
**Advisor:**

## FALL

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGR 186</td>
<td>Intro to Engr. Design</td>
<td>3</td>
<td>CHM 151</td>
<td>General Chemistry I</td>
<td>4</td>
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<tr>
<td>ME 180</td>
<td>Computer Aided-Design</td>
<td>2</td>
<td>CHM 151L</td>
<td>General Chemistry I Lab</td>
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<tr>
<td>MAT 136</td>
<td>Calculus I</td>
<td>4</td>
<td>ENG 105</td>
<td>Critical Reading/Writing</td>
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<td>Liberal Studies Elective</td>
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<td>MAT 137</td>
<td>Calculus II</td>
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<td>Liberal Studies Elective</td>
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<td>PHY 161/L</td>
<td>University Physics I with lab</td>
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## SPRING

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<tbody>
<tr>
<td>CENE 251</td>
<td>Applied Mechanics: Statics</td>
<td>3</td>
<td>CENE 253/L</td>
<td>Mechanics of Materials &amp; Lab</td>
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<tr>
<td>EE 188/L</td>
<td>Electrical Engr. I &amp; Lab</td>
<td>4</td>
<td>MAT 239</td>
<td>Differential Equations</td>
<td>3</td>
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<tr>
<td>EGR 286</td>
<td>Engineering Design: Process</td>
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<td>ME 252</td>
<td>Applied Mech.: Dynamics</td>
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<td>MAT 238</td>
<td>Calculus III</td>
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<td>ME 291</td>
<td>Thermodynamics</td>
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<td>PHY 262</td>
<td>University Physics II</td>
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## SOPHOMORE YEAR

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<th>Credits</th>
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<tbody>
<tr>
<td>CENE 225</td>
<td>Engineering Analysis</td>
<td>3</td>
<td>EGR 386W</td>
<td>Engr. Design: The Methods</td>
<td>3</td>
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<tr>
<td>CS 122/L</td>
<td>Intro Programming</td>
<td>3</td>
<td>MAT 362</td>
<td>Numerical Methods</td>
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<tr>
<td>ME 340</td>
<td>Materials Science <em>(F only)</em></td>
<td>3</td>
<td>ME 365</td>
<td>Machine Design <em>(S only)</em></td>
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<tr>
<td>ME 395</td>
<td>Fluid Mechanics</td>
<td>3</td>
<td>ME 392</td>
<td>Thermodynamics II <em>(S only)</em></td>
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<td>Liberal Studies Elective</td>
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## JUNIOR YEAR

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<th>Course Code</th>
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<tbody>
<tr>
<td>ME 476C</td>
<td>Mech. Engr. Design I <em>(F only)</em></td>
<td>3</td>
<td>ME 486C</td>
<td>Mech. Engr. Design II <em>(S only)</em></td>
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<tr>
<td>ME 450</td>
<td>Heat Transfer <em>(F only)</em></td>
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<td>ME Depth Elective</td>
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<tr>
<td>ME 495</td>
<td>Exp Mthsds Thermal Sci <em>(F only)</em></td>
<td>3</td>
<td>ME Depth Elective</td>
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<tr>
<td>ME</td>
<td>Engineering Breadth Elective</td>
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<td>ME Depth Elective</td>
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<td>Liberal Studies Elective</td>
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## SENIOR YEAR

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<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>ME</td>
<td>Engineering Breadth Elective</td>
<td>3</td>
<td>ME Depth Elective</td>
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<tr>
<td>ME</td>
<td>Liberal Studies Elective</td>
<td>3</td>
<td><strong>Total</strong></td>
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</tbody>
</table>

**Liberal Studies Electives:** (18 hours)  
- At least 18 credit hours in the blocks below*  

<table>
<thead>
<tr>
<th>SPW (6)</th>
<th>AH (6)</th>
<th>CU (6)</th>
</tr>
</thead>
</table>

*Note: 3 of these hours must be cross-listed in the US Ethnic Diversity block, and 3 in the Global Diversity block.

**Mechanical Engineering Depth Electives:** (at least 9 credit hours in mechanical engineering electives)

| ME | ME | ME |

**Engineering Breadth Electives:** (at least 9 credit hours in electives related to mechanical engineering)

| ME | ME | ME |

See reverse side for details of Depth Electives, Breadth Electives, and Liberal Studies courses
Bachelor of Science in Engineering (Mechanical Engineering)

Breadth Electives (9 units minimum):
Breadth electives, totaling 9 credit hours, are upper division (300-400 level) courses from engineering, natural sciences, business, or mathematics. No more than one lower division course (100-200 level) can be used as a breadth elective, and only if the course is required by another major and approved by your advisor. Suggested courses include (but are not limited to) PHY 263, MAT 226, MAT 316, MAT 461, BIO 360, EE 222, EE 280, ECO 284, MKT 303, MGT 303, etc. These courses may also be used to meet minor requirements. Advisor approval for all breadth electives is required.

Depth Electives (9 units minimum):
Mechanical Engineering Depth electives, totaling 9 credit hours, may be selected from any of the courses listed below, or from other 300-, 400-, or 500-level mechanical engineering courses with approval of your advisor and department. The courses below are grouped to encourage you to focus your electives in one of the two primary branches of mechanical engineering. Note, the TENTATIVE plan for teaching of the electives and the prerequisites are shown in parenthesis following the class name in the list below.

Mechanical Design Emphasis:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 454</td>
<td>Finite Element Analysis</td>
<td>(Spring every year / ME 386 or ME 365, MAT 239)</td>
</tr>
<tr>
<td>ME 455</td>
<td>Vibrations</td>
<td>(Fall every year / ME 252, CENE 253, MAT 239)</td>
</tr>
<tr>
<td>ME 467</td>
<td>Manufacturing Processes</td>
<td>(Fall odd years / ME 180, ME 340)</td>
</tr>
<tr>
<td>ME 475</td>
<td>Adaptive Materials and Systems</td>
<td>(Spring odd years / ME 340, MAT 239)</td>
</tr>
<tr>
<td>ME 482</td>
<td>Advanced CAD/CAM</td>
<td>(Fall even years / ME 180, MAT 137)</td>
</tr>
<tr>
<td>ME 484</td>
<td>Mechanical Analysis and Synthesis</td>
<td>(Spring even years / ME 252, CENE 253)</td>
</tr>
<tr>
<td>EE 325</td>
<td>Engineering Analysis II</td>
<td>(Fall every year / MAT 239 and (EE 222 or CS 126)</td>
</tr>
<tr>
<td>EE 458</td>
<td>Automatic Controls</td>
<td>(Fall every year / MAT 239)</td>
</tr>
<tr>
<td>CENE 376</td>
<td>Structural Analysis I</td>
<td>(Fall every year / CENE 253)</td>
</tr>
<tr>
<td>CENE 477</td>
<td>Structural Analysis II</td>
<td>(Spring every year / CENE 376)</td>
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</tbody>
</table>

Fluid/Thermal Sciences Emphasis:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 435</td>
<td>Wind Energy Engineering</td>
<td>(Fall odd years / ME 395)</td>
</tr>
<tr>
<td>ME 441</td>
<td>Compressible Flow</td>
<td>(Spring odd years / ME 291, ME 395)</td>
</tr>
<tr>
<td>ME 442</td>
<td>Aerodynamics</td>
<td>(Spring even years / ME 395)</td>
</tr>
<tr>
<td>ME 451</td>
<td>Renewable Energy</td>
<td>(Fall even years / PHY 262)</td>
</tr>
<tr>
<td>ME 454</td>
<td>Finite Element Analysis</td>
<td>(Spring every year / ME 386 or ME 365, MAT 239)</td>
</tr>
<tr>
<td>EE 325</td>
<td>Engineering Analysis II</td>
<td>(Fall every year / MAT 239 and (EE 222 or CS 126)</td>
</tr>
<tr>
<td>EE 458</td>
<td>Automatic Controls</td>
<td>(Fall every year / MAT 239)</td>
</tr>
<tr>
<td>CENE 430</td>
<td>Air Pollution Controls Design</td>
<td>(Fall every other year, check with CENE dept. / ME 395)</td>
</tr>
<tr>
<td>CENE 480</td>
<td>Environmental Transport Processes</td>
<td>(Fall every year / ME 395)</td>
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</table>

Note: You can use also 500-level courses as depth electives, as a qualified senior with approval from your faculty advisor. For example, ME 520, ME 525, ME 530, ME 540, ME 550, ME 555, ME 560, ME 570, ME 580, ME 581.

LIBERAL STUDIES REQUIREMENTS

The NAU Liberal Studies requirements include 7 credit hours of Foundation courses; 28 credit hours of distribution courses [science/lab science (7), social/political worlds (6), aesthetic/humanistic inquiry (6), cultural understanding (6), distribution elective (3)] and 12-13 credit hours of University Requirements [diversity requirement (6), junior-level writing (3-4) and major capstone experience (3)].

The following requirements will be met by major requirements in the mechanical engineering program:

- Foundation English composition: ENG 105 (4)
- Foundation mathematics: MAT 136 (4)
- Distribution requirements:
  - Science/lab science: PHY 161/L (4) and CHM 151 (4)
  - Distribution elective: PHY 262 (3)
- University Requirements:
  - Junior-level writing: EGR 386W (3)
• Major capstone experience: ME 486C (3)

The following requirements are not met by major requirements:
• Liberal studies distribution requirements (18)
  Social and Political World (6); Aesthetic and Humanistic Inquiry (6) and Cultural Understanding (6)
• University Diversity Requirement (6)—This requirement may be satisfied by taking liberal studies distribution courses that are cross-listed in the US Ethnic Diversity and Global Diversity blocks.
• For detailed information see http://www4.nau.edu/aio/DiversityCourseList.htm and http://www4.nau.edu/aio/LScourselist.htm.