

B.S./M.S., MECHANICAL ENGINEERING

Accelerated B.S./M.S. Degrees

The mission of the mechanical engineering department at UAF is to offer the highest-quality contemporary education at undergraduate and graduate levels, and to perform research appropriate to the technical needs of the state of Alaska, the nation and the world.

Mechanical engineers conceive, plan, design and direct the manufacturing, distribution and operation of a wide variety of devices, machines and systems for energy conversion, environmental control, materials processing, transportation, materials handling and other purposes. Mechanical engineers are engaged in creative design, applied research, development and management. A degree in mechanical engineering also frequently forms the base for entering law, medical or business school, as well as for graduate work in engineering.

The objectives of the mechanical engineering program are to produce graduates who are able to compete successfully on the world stage at the professional level; understand the significant local, regional, national and global issues facing humankind; continue to develop as engineers through lifelong learning; and serve as resources of technical knowledge for the state as well as the nation, especially with respect to northern issues. The Engineering Accreditation Commission of ABET has accredited the B.S. degree program in mechanical engineering since 1980.

Because engineering is based on mathematics, chemistry and physics, students are introduced to the basic principles in these areas during their first two years of study. The third year encompasses courses in the engineering science – extensions to the basic sciences forming the foundation to engineering synthesis and design. The design project course draws on much of the student's previous learning through a simulated industrial design project. Throughout the four-year program, courses in communication, humanities and social sciences are required because mechanical engineers must be able to communicate effectively in written, oral and graphical form.

Students may choose a concentration in mechanical, aerospace or petroleum engineering. Because of UAF's unique location, special emphasis is placed on cold regions engineering problems. This fact is highlighted in the technical elective, Arctic engineering. Candidates for the B.S. degree in mechanical engineering are required to take the State of Alaska Fundamentals of Engineering examination in their general field.

Undergraduate students who plan to pursue graduate studies in engineering may also choose an accelerated degree for a master's in mechanical engineering. This program speeds the process and allows qualified mechanical engineering students to complete both a Bachelor of Science and a Master of Science degree in five years.

Minimum Requirements for Mechanical Engineering Degree: B.S./M.S.: 151 credits

Learn more about the bachelor/master's degree in mechanical engineering (<https://uaf.edu/academics/programs/bachelors/mechanical-engineering-bs-ms.php>), including an overview of the program, career opportunities and more.

College of Engineering and Mines

Department of Mechanical Engineering (<https://cem.uaf.edu/me/>)
907-474-7136

Admission Requirements

Complete the following admission requirements:

1. ME major (junior preferred) or senior standing.
2. GPA 3.25 or above (based on minimum of 24 credits in ME major requirements). Students must maintain a cumulative GPA of 3.0 to remain in the program.
3. Submit a study goal statement.
4. Submit a UAF graduate application for admission.

Program Requirements

Minimum Requirements for Mechanical Engineering B.S./M.S.: 151 credits

Students must satisfy the General University Requirements for minimum grades for the respective B.S. or M.S. program (major) requirements.

| Code | Title | Credits |
|--|---------------------------------------|---------|
| General University Requirements | | |
| Complete the general university requirements. (http://catalog.uaf.edu/bachelors/) | | |
| General Education Requirements | | |
| Complete the general education requirements. (http://catalog.uaf.edu/bachelors/general-education-requirements/) | | |
| B.S. Degree Requirements | | |
| Complete the B.S. degree requirements. (http://catalog.uaf.edu/bachelors/summary-of-bachelors-degree-reqs/#bachelorofsciencetext) | | |
| As part of the B.S. degree requirements, complete: | | |
| MATH F252X | Calculus II | |
| PHYS F211X | General Physics I | |
| PHYS F212X | General Physics II | |
| Master's Degree Requirements | | |
| Complete the master's degree requirements. (http://catalog.uaf.edu/graduate/#masterstext) | | |
| B.S. Program Requirements | | |
| ES F101 | Introduction to Engineering | 3 |
| ES F201 | Computer Techniques | 3 |
| ES F209 | Statics | 3 |
| ES F210 | Dynamics | 3 |
| ES F301 | Engineering Analysis | 3 |
| ES F307 | Elements of Electrical Engineering | 3 |
| ES F331 | Mechanics of Materials | 3 |
| ES F341 | Fluid Mechanics | 4 |
| ES F346 | Introduction to Thermodynamics | 3 |
| ESM F450 | Economic Analysis and Operations | 3 |
| MATH F253X | Calculus III | 4 |
| MATH F302 | Differential Equations | 3 |
| ME F302 | Dynamics of Machinery | 4 |
| ME F308 | Instrumentation and Measurement | 3 |
| ME F313 | Mechanical Engineering Thermodynamics | 3 |

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| ME F321 | Industrial Processes | 3 |
| ME F334 | Elements of Material Science/ Engineering | 3 |
| ME F403 | Machine Design | 3 |
| ME F408 | Mechanical Vibrations | 3 |
| ME F415 | Thermal Systems Laboratory | 3 |
| ME F441 | Heat and Mass Transfer | 3 |
| ME F486 | Senior Design ¹ | 1 |
| ME F487 | Design Project ¹ | 3 |

Fundamentals of Engineering Examination

Complete State of Alaska Fundamentals of Engineering examination.

M.S. Program Requirements

Complete the master's degree requirements.
(<http://catalog.uaf.edu/graduate/mastersdegrees/#masterofsciencewithprojecttext>)

Thesis or Non-Thesis Requirements

| | | |
|--|-----------------------------|----|
| Program Electives | | 15 |
| Any 600-level ME course; up to 6 credits may be at the 400 level ² | | |
| General Electives | | 9 |
| Any 600-level courses approved by the student's advisory committee; up to 6 credits may be at the 400 level ² | | |
| Complete the thesis or non-thesis option: | | 30 |
| <i>Thesis</i> | | |
| ME F699 | Thesis | 6 |
| <i>Non-Thesis</i> | | |
| ME F698 | Non-thesis Research/Project | 6 |

¹ Fulfills the baccalaureate capstone requirement.

² At least 15 total program and general elective credits must be at the 600-level.

Note: This degree program must be completed in seven years or the student will be disqualified from the program. If a student is disqualified for exceeding the seven-year limit, a mechanical engineering B.S. degree will be awarded if:

1. coursework is completed in 10 years, and
2. the student meets all ME B.S. requirements.