

## MECHANICAL ENGINEERING M.S.

All students must meet the Requirements for the Master's Degree

### OVERVIEW

The Mechanical Engineering Graduate Program offers a Master's of Science (M.S.) degree in mechanical engineering. Each student must meet the general requirements for admission as outlined under the regulations of the University of Vermont Graduate College. Typically, students entering the program have received a bachelor's degree in mechanical engineering or a related field. Applicants with other backgrounds will be evaluated individually and must complete prescribed undergraduate technical course work. Part-time study leading to the M.S. degree is also possible for engineers who are employed in the vicinity. Areas of research interest in the program currently include: Aerospace Engineering, Turbulence, Complex and Bio Fluids, Multiscale Mechanics, Robotics, Nanomaterials & Composites, Energy Harvesting, System Control & Diagnostics, Biomechanics & Orthopedics, Biomaterials, and High-performance Computing.

### SPECIFIC REQUIREMENTS

#### Requirements for Admission to Graduate Studies for the Degree of Master of Science

An accredited bachelor's degree in Mechanical Engineering or equivalent is the typical requirement; however, students holding a bachelor's degree in a related engineering or scientific field may also qualify for admission. Completion of the general (aptitude) portion of the Graduate Record Examination is required only for those students who are applying for a Graduate Teaching or Research Assistantship.

#### Minimum Degree Requirements for the Degree of Master of Science

The Mechanical Engineering Graduate Program offers both thesis and non-thesis options for the master's degree. Both options require the completion of advanced courses in mechanical engineering, mathematics, and other approved courses and research (for thesis students) totaling at least 30 credits. Graduate students receiving financial support via teaching or research fellowships are required to select the thesis option. Part-time students typically select the non-thesis option but may choose the thesis option if they prefer. Students normally decide on which option they intend to pursue at the beginning of their program.

All students are required to complete 30 credits, at least 6 of which must be at the 6000-level, including:

Requirement Description		Credits
ME 5040	Adv Engineering Analysis I	3
ME 5160	Continuum Mechanics	3

Numerical Methods requirement: Either ME 5980 (Numerical Methods for Engineer), ME 5990 (AST: Computational Fluid Dynamics), ME 5520 (Computational Solid Mechanics), ME 6550 (Multiscale Modeling), or equivalent course at 5000- or 6000- level.	3
6 course credits in the same area of specialization within mechanical engineering.	6

Currently, the program offers areas of specialization in:

- Biomechanics and Biomaterials;
- Control and Design of Mechanical Systems;
- Materials Science and Engineering
- Thermodynamics, Fluids and Energy; and
- Computational Mechanics

Further details on the core course requirements and the areas of specialization can be obtained from the Mechanical Engineering Graduate Program website.

Requirement Description	Credits
Option A (Thesis)	
In addition to core courses, students selecting the thesis option must complete between 6 and 9 thesis credits (ME 6391) prior to the master's thesis defense, with the expectation that the student's research must culminate in an original piece of work publishable as a conference proceedings paper or a peer-reviewed journal article. Those opting for a 6-credit thesis must complete an additional 3 credits of approved course work	
Option B (Non-thesis)	
Students selecting the non-thesis option must complete an additional 15 credits of course work beyond the core credits in lieu of a thesis. Of the additional course work, a minimum of 9 credits must be in a chosen area of specialization.	

#### Comprehensive Examination

The comprehensive examination for the thesis option consists in successfully presenting a proposal research seminar.

Candidates in the non-thesis option must successfully present a 25-min. public seminar for the Mechanical Engineering Seminar Series. The seminar should be a comprehensive literature review on a subject matter relevant to the candidate's chosen area of specialization in mechanical engineering.

The candidate is given a maximum of 2 opportunities to pass the comprehensive examination.

#### Requirements for Advancement to Candidacy for the Degree of Master of Science

A cumulative grade point average of 3.00 or better.