

MECHANICAL ENGINEERING, M.S.M.E.

Program Description

The Master of Science in Mechanical Engineering (M.S.M.E.) degree is designed to provide students with the knowledge, skill, and professional practices needed to develop and design mechanical engineering related systems. The program also prepares students who desire to pursue further graduate work leading to a Ph.D. degree.

Accelerated Graduate Degree in Mechanical Engineering

Students enrolled in the Mechanical Engineering Accelerated Graduate Degree program can complete the bachelor's degree by lowering the number of undergraduate credits with up to 12 graduate credits that will apply to the master's degree in mechanical engineering.

- *Thesis Option:* Three graduate ME courses can be taken to meet the technical electives requirement, and another required undergraduate course can be substituted by a ME graduate course.
- *Coursework Option:* Three graduate ME courses can be taken to meet the technical electives requirement, and another required undergraduate course can be substituted by a ME graduate course.

Applicants for the Accelerated Graduate Degree program in Mechanical Engineering must be undergraduate Mechanical Engineering students and have completed a minimum of 65 credit hours. The applicant must have a minimum overall Grade Point Average of 3.3.

Admission Requirements

Applicants should follow the admissions process described in this catalog or at the Graduate Admissions website: <http://www.marshall.edu/graduate/admissions/how-to-apply-for-admission> (<http://www.marshall.edu/graduate/admissions/how-to-apply-for-admission/>). Each applicant must have an undergraduate

At least one letter of recommendation from either an accredited ABET curriculum or an internationally recognized program.

1. If applicants have an undergraduate 2.5 or higher GPA on a 4.0 scale and have already passed the PE exam in the major for which they are applying (official copy of certificate to be sent to the Marshall University Graduate Admissions Office), their applications will be accepted.
2. If applicants have an undergraduate GPA of 3.0 or higher on a 4.0 scale in an engineering major closely related to that for which they are applying, their applications will be evaluated on a case-by-case basis.
3. If applicants have an undergraduate GPA between a 2.5 and 3.0 on a 4.0 scale in an engineering major closely related to that for which they are applying, applicants must take the GRE exam or pass the FE exam, and have their official GRE scores or official FE certificate sent to the Marshall University Graduate Admissions office. The applications will be evaluated on a case-by-case basis. A GRE score is required for all applicants.

International applicants must provide proof of English proficiency according to applicable university requirements. International applicants must meet all other admission criteria prior to being

admitted to the program and registering for the first semester of courses.

A current non-degree or degree-seeking Marshall University student who holds an undergraduate engineering degree, may apply to be considered for admission to the M.S.E. degree program if s/he has at least a minimum cumulative graduate GPA of 3.30 in his or her first 9 credit hours of M.S.E. courses. For international students, the English requirements stated above must still be satisfied.

Eligibility to take the PE exam is based primarily on completion of an ABET-accredited undergraduate engineering degree in most states. Completion of a M.S.E. graduate degree at an institution with an ABET-accredited undergraduate degree does not fulfill that requirement to take the PE exam.

Program Requirements

Each degree candidate is required to complete at least 30 graduate credit hours, with a cumulative Grade Point Average of 3.0 for the courses included in the student's Plan of Study. At least one-half of the minimum required hours for the degree must be earned in classes numbered 600 or above.

Each degree-seeking student must file an approved "Plan of Study," developed with a faculty advisor, before the student registers for the 12th credit hour. The M.S. degree in Mechanical Engineering requires a student to take a sequence of courses that shows a "clearly discernible specialty or concentration." In consultation with his/her advisor, an M.S. student can develop a concentration specifically tailored to his/her interests and objectives. Focus areas include sustainability, materials and manufacturing, bio-mechanical engineering, thermo/fluids, and mechanics/design. At least three of the elective courses (9 CR) must be within the student's focus area at the 600 level.

Students may choose to complete either the thesis option or the coursework-only option after consultation with their academic advisors.

Accelerated Graduate Degree in Mechanical Engineering

Students enrolled in the Mechanical Engineering Accelerated Graduate Degree program can complete the bachelor's degree by lowering the number of undergraduate credits (up to 12) with up to 12 graduate credits that will apply to the master's degree in mechanical engineering. Please see the section on Accelerated Graduate Degrees in this catalog for further information.

1. *Thesis Option:* Three graduate ME, CE, ENGR or EE Courses (500 or 600 Level) can be taken to meet the Technical Electives requirement. In addition, ENGR 451 Intro to Proj Management can be substituted by EM 660 Project Management, or ME 420 Control Systems can be substituted by ME 560 Automation and Control.
2. *Coursework Option:* Three graduate ME, CE, ENGR or EE (500 or 600 Level) can be taken to meet the Technical Electives requirement. In addition, ENGR 451 Intro to Proj Management can be substituted by EM 660 Project Management, or ME 420 Control Systems can be substituted by ME 560 Automation and Control.

Applicants for the Accelerated Graduate Degree program in Mechanical Engineering must be undergraduate Mechanical Engineering students and have completed a minimum of 80 credit hours, including:

| Code | Title | Credit Hours | | | |
|----------|--------------------------|--------------|------------------------------|---------------------------|-----------|
| ENGR 318 | Fluid Mechanics | 3 | ME 602 | Advanced Engr Analysis II | 3 |
| ENGR 335 | Adv Engineering Analysis | 3 | Seven Elective Courses (p.) | | 21 |
| ME 310 | Thermodynamics II | 3 | Total Credit Hours | | 30 |
| ME 340 | Machine Element Design | 3 | | | |
| ME 455 | Metallurgy | 3 | | | |

The applicant must have a minimum overall Grade Point Average of 3.30, with 3.3 in the major and no less than a *B* grade in the following courses:

| Code | Title | Credit Hours |
|----------|--------------------------|--------------|
| ENGR 335 | Adv Engineering Analysis | 3 |
| ME 310 | Thermodynamics II | 3 |
| ME 340 | Machine Element Design | 3 |
| ME 455 | Metallurgy | 3 |

Plan of Study

Thesis Option

(30 hours)

The thesis option involves the completion of 6 HR of ME 699 Thesis under the direction of an advisor on an approved topic. The student must prepare a formal thesis proposal (including a statement of work, extensive literature search, and proposed timeline) in consultation with his or her advisor and present the proposal to a graduate thesis committee, which is formed in consultation with the advisor. The thesis proposal must be defended and approved by the thesis committee prior to the final semester of study. Students must then summarize their research work in the form of a formal, written thesis and successfully defend it before their thesis committee in order to fulfill the requirements for the degree. Thesis work is typically conducted over two semesters.

| Code | Title | Credit Hours |
|-----------------------------|---------------------------|--------------|
| ENGR 570 | Finite Elements | 3 |
| ME 601 | Advanced Engr Analysis I | 3 |
| ME 602 | Advanced Engr Analysis II | 3 |
| ME 604 | Research Methods | 3 |
| Four Elective Courses (p.) | | 12 |
| ME 699 | Thesis | 6 |
| Total Credit Hours | | 30 |

Coursework-Only Option

(30 hours)

Students can complete 30 hours of coursework and then complete a comprehensive examination within the last two semesters of graduation to fulfill the requirements of their degree. Examinations will be administered once per semester for all students.

| Code | Title | Credit Hours |
|----------|--------------------------|--------------|
| ENGR 570 | Finite Elements | 3 |
| ME 601 | Advanced Engr Analysis I | 3 |