

MECHANICAL ENGINEERING (ENGINEERING)

Degree Requirements

Master of science (M.S.)

Requirements listed here are in addition to Graduate Council policies listed under GCAC-600 Research Degree Policies. (<https://gradschool.psu.edu/graduate-education-policies/>)

The M.S. degree program is designed for students to gain advanced knowledge for research, analysis, and design in mechanical engineering.

Resident students pursuing an M.S. degree may choose one of two options: completion of 24 course credits and the submission of a thesis (6 credits) to the Graduate School, or 30 course credits and the submission of a scholarly paper to the department. The M.S. degree program is also offered on-line in which only the 30 course credits and the submission of a scholarly paper is permitted. The requirements for the M.S. M E degree program are:

1. Minimum of 30 course credits at the 400 level or higher, of which 20 course credits must be earned at Penn State. Note that 2 additional credits are required by enrolling in the ME 590 Colloquium but these 2 additional credits do not count toward the 30 course credits. The required course credits must be completed with a grade point average of 3.00 or higher.
2. All students must successfully complete two credits of ME 590 Colloquium preferably in their first two semesters in the program. These two colloquium credits do not count toward the 30 course credits in Requirement 1 above.
3. At least 18 credits in 500- and 600-level courses.
4. A minimum of 12 credits in 400- and 500-level courses in Mechanical Engineering, excluding ME 410, ME 440W, ME 441W, ME 442W, ME 443W, ME 450, and any other required undergraduate courses. ME 596 cannot be used to fulfill this requirement.
5. The MSME requires three credits of mathematics. These credits must be taken from the following group of courses:

Code	Title	Credits
EMCH 524A	Mathematical Methods in Engineering	3
EMCH 524B	Mathematical Methods in Engineering	3
ME 512	Heat Transfer--Conduction	3
ME 550	Foundations of Engineering Systems Analysis	3
400- and 500-level MATH courses (MATH 4XX, MATH 5XX) except the following:		
MATH 419	Theoretical Mechanics	
MATH 427	Foundations of Geometry	
MATH 428	Geometry for Teachers	
MATH 435	Basic Abstract Algebra	
MATH 451	Numerical Computations	
MATH 455	Introduction to Numerical Analysis I	
MATH 456	Introduction to Numerical Analysis II	
MATH 461		
MATH 470	Algebra for Teachers	
MATH 471	Geometry for Teachers	
MATH 475Y	History of Mathematics	

MATH 482 Mathematical Methods of Operations Research

MATH 484 Linear Programs and Related Problems

Courses with specific focus on numerical analysis will not count toward the mathematics requirement.

6. A thesis or paper must be presented to meet the specific requirement of the culminating experience type selected; the paper may take the form of a doctoral research proposal if agreed upon in advance by the student and the graduate adviser. Online students seeking an MSME degree will only be permitted to write a paper.
7. Preparatory course(s) required for teaching assistants (such as ENGR 888), remedial courses, and any courses required in our undergraduate program are not counted toward degree requirements.

CULMINATING EXPERIENCE OPTION A - M.S. THESIS

Candidate registers for a minimum of six credits of ME 600 or ME 610 and submits a thesis following the procedures specified by the Graduate School. This program will consist of at least 24 course credits of which 18 credits must be at the 500 level (not including ME 596), and six thesis credits. At least 12 credits must be 400- or 500-level Mechanical Engineering courses.

CULMINATING EXPERIENCE OPTION B - M.S. PAPER

Candidate registers for 30 course credits of which 18 credits must be at the 500 level. A maximum of three credits of ME 596 can be counted in the total of 30 credits. At least 12 credits must be 400- or 500-level Mechanical Engineering courses. Candidates write a paper on a topic mutually agreed upon by the adviser suitable for publication in a professional journal or presentation at a national or international conference.

Doctor of Philosophy (Ph.D.)

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The Ph.D. program emphasizes scholarly research and helps students prepare for research and related careers in industry, government, and academe. Students must pass written and oral qualifying examinations. The Ph.D. program is quite flexible, with minimal formal requirements. The Ph.D. is awarded upon completion of a program of advanced study that includes a minimum period of residence, a satisfactory dissertation, and the passing of comprehensive and final oral examinations as determined by the student's Ph.D. committee.

Generally, a Ph.D. student must have 30 credits above a master's degree before taking the comprehensive examination.