MECHANICAL ENGINEERING: MODELING AND SIMULATION IN MECHANICAL ENGINEERING, MS

REQUIREMENTS

MINIMUM GRADUATE SCHOOL REQUIREMENTS

Review the Graduate School minimum degree requirements (https://guide.wisc.edu/graduate/#requirementstext) and policies (https://guide.wisc.edu/graduate/#policiestext), in addition to the program requirements listed below.

NAMED OPTION REQUIREMENTS

MODE OF INSTRUCTION

Face to Face	Evening/ Weekend	Online	Hybrid	Accelerated
Yes	No	No	No	Yes

Mode of Instruction Definitions

Accelerated: Accelerated programs are offered at a fast pace that condenses the time to completion. Students typically take enough credits aimed at completing the program in a year or two.

Evening/Weekend: Courses meet on the UW–Madison campus only in evenings and/or on weekends to accommodate typical business schedules. Students have the advantages of face-to-face courses with the flexibility to keep work and other life commitments.

Face-to-Face: Courses typically meet during weekdays on the UW-Madison Campus.

Hybrid: These programs combine face-to-face and online learning formats. Contact the program for more specific information.

Online: These programs are offered 100% online. Some programs may require an on-campus orientation or residency experience, but the courses will be facilitated in an online format.

CURRICULAR REQUIREMENTS

Requirement	Detail
Minimum Credit Requirement	30 credits
Minimum Residence Credit Requirement	18 credits
Minimum Graduate Coursework Requirement	15 credits must be graduate-level coursework. Refer to the Graduate School: Minimum Graduate Coursework (50%) Requirement policy: https://policy.wisc.edu/library/UW-1244 (https://policy.wisc.edu/library/UW-1244/).
Overall Graduate GPA Requirement	3.00 GPA required. Refer to the Graduate School: Grade Point Average (GPA) Requirement policy: https://policy.wisc.edu/library/UW-1203 (https://policy.wisc.edu/library/UW-1203/).
Other Grade Requirements	Students must earn a C or above in all formal coursework. Students may not have more than two incompletes on their record at any one time.
Assessments and Examinations	None.
Language Requirements	No language requirements.

REQUIRED COURSES

All courses for the Mechanical Engineering graduate program must be numbered 400 and above. Exception: Up to two courses (6 credits) numbered 300-399 in engineering, math, or the sciences taken at UW-Madison can also be used towards the formal course credit requirement. These courses can be from Mechanical Engineering (M E (https://guide.wisc.edu/courses/m_e/)) and/or Engineering Mechanics (E M A (https://guide.wisc.edu/courses/e_m_a/)) only if approved by the student's advisor and the Mechanical Engineering graduate committee. No thesis/research credits are permitted.

Code	Title	Credits
Graduate Seminar		
Two semesters of seminar, successfully completed, are required. These should be taken during the first two semesters (Fall and Spring).		
M E 903	Graduate Seminar (taken twice)	0
Formal Credits Requirement [1]		
Complete the following requirements (requirements may overlap)		24
Minimum 24 formal course credits		
Minimum 15 formal credits in Mechanical Engineering (M E) taken at UW-Madison		
Minimum 15 formal credits (5 courses) from the Core Courses list (below)		
Remaining Courses		
Minimum 6 credits from Formal Credits Requirement (above) or following courses:		6
M E 699	Advanced Independent Study	
M E 702	Graduate Cooperative Education Program	
Seminar Credits [2]		
Total Credits		**30**

[1] Formal credits/courses are any course offering that is not a seminar course, thesis/research course, independent study, co-op/internship, etc.

[2] Maximum 3 credits of seminar coursework permitted within program/degree.

Core Courses List:

Code	Title	Credits
A minimum of 5 courses (15 credits total) must be taken from the courses listed:		
M E 440	Intermediate Vibrations	
M E/E C E 441	Kinematics, Dynamics, and Control of Robotic Manipulators	
M E 451	Kinematics and Dynamics of Machine Systems	
M E 459	Computing Concepts for Applications in Engineering	
M E 460	Applied Thermal / Structural Finite Element Analysis	
M E 468	Computer Modeling and Simulation of Autonomous Vehicles and Robots	
M E 531		
M E/B M E 516	Finite Elements for Biological and Other Soft Materials	
M E/COMP SCI/ E C E 532	Matrix Methods in Machine Learning	
M E 535	Computer-Aided Geometric Design	
M E 548	Introduction to Design Optimization	
M E 563	Intermediate Fluid Dynamics	
M E 564	Heat Transfer	
M E 573	Computational Fluid Dynamics	
M E 601	Special Topics in Mechanical Engineering (Applied & Computational Math w/Engineering Apps)	
M E 748	Optimum Design of Mechanical Elements and Systems	
M E 751	Advanced Computational Dynamics	
M E/COMP SCI/ E C E/E M A/ E P 759	High Performance Computing for Applications in Engineering	
M E 764	Advanced Heat Transfer I-Conduction	
M E 964	Special Advanced Topics in Mechanical Engineering (Topic: "Sci Computing for Apps in Eng")	
E M A 521	Aerodynamics	
E M A 522	Aerodynamics Lab	
E M A 605	Introduction to Finite Elements	
E M A 705	Advanced Topics in Finite Elements	
COMP SCI 412	Introduction to Numerical Methods	
COMP SCI/ MATH 513	Numerical Linear Algebra	
COMP SCI/ MATH 514	Numerical Analysis	
COMP SCI/E C E/ I SY E 524	Introduction to Optimization	
COMP SCI/E C E/ M E 539	Introduction to Artificial Neural Networks	

Advisor Approval of Study Plan

The faculty advisor must always approve the courses a student takes in the MS program. Students should schedule an appointment with their advisor when selecting their courses. During the final semester, the faculty advisor will review the courses taken again and if approved, sign the warrant request form.

Other Policy

Students in this program may not take courses outside the prescribed curriculum without faculty advisor and program director approval. Students in this program cannot enroll concurrently in other undergraduate or graduate degree programs.