

ENGINEERING MECHANICS: FUNDAMENTALS OF APPLIED MECHANICS, M.S.

This is a named option within the Engineering Mechanics M.S (<http://guide.wisc.edu/graduate/mechanical-engineering/engineering-mechanics-ms/>).

Admissions to the Fundamentals of Applied Mechanics named option will be suspended as of fall 2022, and the program will be discontinued as of fall 2024. If you have any questions, please contact the department.

The Fundamentals of Applied Mechanics (FAM) option of the Master of Science degree in Engineering Mechanics is primarily designed for students with a science background who would like to transition to engineering. It may also be suitable for non-mechanics engineering students (electrical, chemical, etc.) who are interested in transitioning to mechanics. The goal of this program is to provide a bridge to careers in engineering or to a Ph.D program in mechanics. FAM is fast-paced; students are expected to complete the curriculum over a twelve-month period, starting in a summer session. Prospective graduate students with a background in mechanics are encouraged to consider our M.S. Research option (<http://guide.wisc.edu/graduate/mechanical-engineering/engineering-mechanics-ms/engineering-mechanics-research-ms/>) and Ph.D. in Engineering Mechanics programs (<http://guide.wisc.edu/graduate/mechanical-engineering/engineering-mechanics-phd/>).

For more information on this specific degree plan, please visit the EP website (<https://www.engr.wisc.edu/department/engineering-physics/>).

ADMISSIONS

Admissions to the Fundamentals of Applied Mechanics named option will be suspended as of Fall 2022, and the program will be discontinued as of Fall 2024. If you have any questions, please contact the department.

Please consult the table below for key information about this degree program's admissions requirements. The program may have more detailed admissions requirements, which can be found below the table or on the program's website.

Graduate admissions is a two-step process between academic programs and the Graduate School. **Applicants must meet** the minimum requirements (<https://grad.wisc.edu/apply/requirements/>) **of the Graduate School as well as the program(s)**. Once you have researched the graduate program(s) you are interested in, apply online (<https://grad.wisc.edu/apply/>).

Requirements	Detail
Fall Deadline	This program does not admit in the fall.
Spring Deadline	The program does not admit in the spring.
Summer Deadline	December 15

GRE (Graduate Record Examinations)	Not required.
English Proficiency Test	Every applicant whose native language is not English or whose undergraduate instruction was not in English must provide an English proficiency test score and meet the Graduate School minimum requirements (https://grad.wisc.edu/apply/requirements/#english-proficiency).
Other Test(s) (e.g., GMAT, MCAT)	n/a
Letters of Recommendation Required	3

The Fundamentals of Applied Mechanics option of the Master of Science degree in Engineering Mechanics (FAM) is primarily designed for students with a science background who would like to transition to engineering. It may also be suitable for non-mechanics engineering students (electrical, chemical, etc.) who are interested in transitioning to mechanics. Prospective graduate students with a background in mechanics are encouraged to consider our primary M.S. (<https://guide.wisc.edu/graduate/engineering-physics/engineering-mechanics-ms/>) and Ph.D. in Engineering Mechanics (<https://guide.wisc.edu/graduate/engineering-physics/engineering-mechanics-phd/>) programs.

The Graduate School sets minimum requirements for admissions (<https://grad.wisc.edu/admissions/requirements/>). Academic program admission requirements are often more rigorous than those set by the Graduate School. Please check the program website (<https://www.engr.wisc.edu/department/engineering-physics/academics/master-science-engineering-mechanics-fundamentals-applied-mechanics-option/>) for details and admissions deadlines.

FUNDING

GRADUATE SCHOOL RESOURCES

Resources to help you afford graduate study might include assistantships, fellowships, traineeships, and financial aid. Further funding information (<https://grad.wisc.edu/funding/>) is available from the Graduate School. Be sure to check with your program for individual policies and restrictions related to funding.

PROGRAM INFORMATION

Students enrolled in this program are not eligible to receive tuition remission from graduate assistantship appointments at this institution.

Students in violation of this policy may be placed on departmental probation.

REQUIREMENTS

MINIMUM GRADUATE SCHOOL REQUIREMENTS

Review the Graduate School minimum academic progress and degree requirements (<http://guide.wisc.edu/graduate/>)

#policiesandrequirements text), in addition to the program requirements listed below.

NAMED OPTION REQUIREMENTS MODE OF INSTRUCTION

Face to Face	Evening/ Weekend	Online	Hybrid	Accelerated
No	No	No	Yes	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	16 credits
Minimum Graduate Coursework Requirement	15 of the required 30 credits must be in graduate-level coursework from E M A and Engineering Physics; courses with the Graduate Level Coursework attribute are identified and searchable in the university's Course Guide (https://registrar.wisc.edu/course-guide (https://registrar.wisc.edu/course-guide/)).
Overall Graduate GPA Requirement	3.00 GPA required.
Other Grade Requirements	Courses in which grades of BC, C, or below are received cannot be counted toward the degree except as follows: 1) Credits of C will be allowed provided they are balanced by twice as many credits of A or by four times as many credits of AB, 2) Credits of BC will be allowed provided they are balanced by twice as many credits of AB or by an equal number of credits of A.
Assessments and Examinations	None.
Language Requirements	No language requirements.

REQUIRED COURSES

Code	Title	Credits
Summer Session		
3-6		
E M A 303	Mechanics of Materials	3
E M A 202	Dynamics (strongly recommended prerequisite) ¹	3
Fall Semester		
14		
M E/E M A 307	Mechanics of Materials Lab	1
E M A 506	Advanced Mechanics of Materials I	3
E M A 542	Advanced Dynamics	3
E M A/E P 547	Engineering Analysis I	3
E M A 601	Special Topics in Engineering Mechanics (Topic: Mechanics Seminar)	1
E M A 405 or E M A 605	Practicum in Finite Elements Introduction to Finite Elements	3
Spring Semester		
13		
E M A/E P 548	Engineering Analysis II	3
E M A 601	Special Topics in Engineering Mechanics (Topic: Mechanics Seminar)	1
<i>Choose three of the following:</i> ²		9
E M A/CIV ENGR/ M E 508	Composite Materials	
E M A 519	Fracture Mechanics	
E M A/M E 570	Experimental Mechanics	
E M A 611	Advanced Mechanical Testing of Materials	
E M A 622	Mechanics of Continua	
E M A 642	Satellite Dynamics	
E M A 705	Advanced Topics in Finite Elements	

1

While strongly recommended, E M A 202 Dynamics will not satisfy any degree requirement for this program and will not count toward the 30 credits required to earn the degree.

2

At least one of the three must be either E M A 705 Advanced Topics in Finite Elements, E M A 622 Mechanics of Continua, or E M A 642 Satellite Dynamics.

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.

POLICIES

GRADUATE SCHOOL POLICIES

The Graduate School's Academic Policies and Procedures (<https://grad.wisc.edu/acadpolicy/>) provide essential information regarding general university policies. Program authority to set degree policies beyond the minimum required by the Graduate School lies with the degree program faculty. Policies set by the academic degree program can be found below.

NAMED OPTION-SPECIFIC POLICIES

PRIOR COURSEWORK

Graduate Work from Other Institutions

No transfer credits are allowed.

UW–Madison Undergraduate

With program approval, students are allowed to count up to 7 credits of coursework from the following list of courses:

Code	Title	Credits
E P/E M A 547	Engineering Analysis I	3
E P/E M A 548	Engineering Analysis II	3
E M A 303	Mechanics of Materials	3
E M A/M E 307	Mechanics of Materials Lab	1
E M A 405	Practicum in Finite Elements	3
E M A 405	Practicum in Finite Elements	3
E M A 506	Advanced Mechanics of Materials I	3
E M A/CIV ENGR/ M E 508	Composite Materials	3
E M A 519	Fracture Mechanics	3
E M A 542	Advanced Dynamics	3
E M A/M E 570	Experimental Mechanics	3
E M A 605	Introduction to Finite Elements	3
E M A 611	Advanced Mechanical Testing of Materials	3
E M A 622	Mechanics of Continua	3
E M A 642	Satellite Dynamics	3
E M A 705	Advanced Topics in Finite Elements	3

These may be counted toward the Minimum Graduate Degree Credit Requirement as applicable. No credits may be counted toward the minimum graduate residence credit requirement. Coursework earned five or more years prior to admission to a master's degree is not allowed to satisfy requirements.

UW–Madison University Special

With program approval, students are allowed to count up to 15 credits of coursework numbered 400 or above taken as a UW–Madison Special student toward the minimum graduate residence credit requirement, and the minimum graduate degree credit requirement. UW–Madison coursework taken as a University Special student would not be allowed to count toward the 50% graduate coursework minimum unless taken at the 700 level or above. Coursework earned five or more years prior to admission to a master's is not allowed to satisfy requirements.

PROBATION

A semester GPA below 3.0 will result in the student being placed on academic probation. If a semester GPA of 3.0 is not attained during the subsequent semester of full time enrollment (or 12 credits of enrollment if enrolled part-time) the student may be dismissed from the program or allowed to continue for one additional semester based on advisor appeal to the Graduate School.

ADVISOR / COMMITTEE

Each student is required to meet with his or her advisor prior to registration every semester.

CREDITS PER TERM ALLOWED

15 credits

TIME CONSTRAINTS

Students are expected to complete the FAM degree program in one calendar year, i.e., 12 months (summer session plus two semesters). One additional semester is permitted to complete the requirements, if needed.

GRIEVANCES AND APPEALS

These resources may be helpful in addressing your concerns:

- Bias or Hate Reporting (<https://doso.students.wisc.edu/bias-or-hate-reporting/>)
- Graduate Assistantship Policies and Procedures (<https://hr.wisc.edu/policies/gapp/#grievance-procedure>)
- Hostile and Intimidating Behavior Policies and Procedures (<https://hr.wisc.edu/hib/>)
 - Office of the Provost for Faculty and Staff Affairs (<https://facstaff.provost.wisc.edu/>)
- Dean of Students Office (<https://doso.students.wisc.edu/>) (for all students to seek grievance assistance and support)
- Employee Assistance (<http://www.eao.wisc.edu/>) (for personal counseling and workplace consultation around communication and conflict involving graduate assistants and other employees, post-doctoral students, faculty and staff)
- Employee Disability Resource Office (<https://employee disabilities.wisc.edu/>) (for qualified employees or applicants with disabilities to have equal employment opportunities)
- Graduate School (<https://grad.wisc.edu/>) (for informal advice at any level of review and for official appeals of program/departmental or school/college grievance decisions)
- Office of Compliance (<https://compliance.wisc.edu/>) (for class harassment and discrimination, including sexual harassment and sexual violence)
- Office of Student Conduct and Community Standards (<https://conduct.students.wisc.edu/>) (for conflicts involving students)
- Ombuds Office for Faculty and Staff (<http://www.ombuds.wisc.edu/>) (for employed graduate students and post-docs, as well as faculty and staff)
- Title IX (<https://compliance.wisc.edu/titleix/>) (for concerns about discrimination)

Engineering Mechanics Grievance Procedures

Students who feel that they have been treated unfairly have the right to a prompt hearing of their grievance. Such complaints may involve course grades, classroom treatment, advising, various forms of harassment, or other issues. Any student or potential student may use these procedures.

- The student should speak first with the person toward whom the grievance is directed. In most cases, grievances can be resolved at this level.
- Should a satisfactory resolution not be achieved, the student should contact the program's Grievance Advisor to discuss the grievance. The Graduate Student Coordinator can provide students with the name of this faculty member, who facilitates problem resolution through informal channels. The Grievance Advisor is responsible for facilitating any complaints or issues of students. The Grievance Advisor first attempts to help students informally address the grievance prior to any formal complaint. Students are also encouraged to talk with

their faculty advisors regarding concerns or difficulties if necessary. University resources for sexual harassment concerns can be found on the UW Office of Equity and Diversity website.

- If the issue is not resolved to the student's satisfaction, the student can submit the grievance to the Grievance Advisor in writing, within 60 calendar days of the alleged unfair treatment.
- On receipt of a written complaint, a faculty committee will be convened by the Grievance Advisor to manage the grievance. The program faculty committee will obtain a written response from the person toward whom the complaint is directed. The response will be shared with the person filing the grievance.
- The faculty committee will determine a decision regarding the grievance. The Grievance Advisor will report on the action taken by the committee in writing to both the student and the party toward whom the complaint was directed within 15 working days from the date the complaint was received.
- At this point, if either party (the student or the person toward whom the grievance is directed) is unsatisfied with the decision of the faculty committee, the party may file a written appeal. Either party has 10 working days to file a written appeal to the College of Engineering.

The Assistant Dean for Graduate Affairs (enr-dean-graduateaffairs@engr.wisc.edu) provides overall leadership for graduate education in the College of Engineering (CoE) and is a point of contact for graduate students who have concerns about education, mentoring, research, or other difficulties.

The Graduate School has procedures for students wishing to appeal a grievance decision made at the college level. These policies are described in the Academic Policies and Procedures at <https://grad.wisc.edu/academic-policies/>.

OTHER

Students are strongly discouraged to pursue positions as Project Assistants, Teaching Assistants or Research Assistants during their time in this program, as the rigor and accelerated nature of this program may not accommodate those work time commitments. Students in this program will not receive the tuition remission that is typically part of the compensation package for a graduate assistantship.

PROFESSIONAL DEVELOPMENT

GRADUATE SCHOOL RESOURCES

Take advantage of the Graduate School's professional development resources (<https://grad.wisc.edu/pd/>) to build skills, thrive academically, and launch your career.

PEOPLE

PROFESSORS

Darryl Thelen (Chair)
Peter Adamczyk
Mark Anderson
Riccardo Bonazza
Curt Bronkhorst
Wendy Crone
Christian Franck
Jaal Ghandhi

Sage Kokjohn
Dan Negrut
Gregory F. Nellis
Tim Osswald
Frank Pfefferkorn
Xiaoping Qian
Douglas Reindl
David Rothamer
Scott T. Sanders
Krishnan Suresh
Mario F. Trujillo
Lih-sheng Turng
Fabian Waleffe

ASSOCIATE PROFESSORS

Lianyi Chen
Melih Eriten
Katherine Fu
Tom N. Krupenkin
Ying Li
Franklin Miller
Sangkee Min
Wenxiao Pan
James Pikul
Pavana Prabhakar
Alejandro Roldan-Alzate
Michael Zinn

ASSISTANT PROFESSORS

Joseph Andrews
Jennifer Franck
Corinne Henak
Eric Kazyak
Allison Mahvi
Luca Mastropasqua
Jacob Notbohm
Josh Roth
Shiva Rudraraju
Stephan Rudykh
Eric Tervo
Ramathanan Thevamaran
Dakotah Thompson
Michael Wagner
Wei Wang
Michael Wehner
Jinlong Wu
Xiaobin Xiong
Xiangru Xu
Lei Zhou

See also Mechanical Engineering Faculty Directory (<https://directory.engr.wisc.edu/me/faculty/>).