

# MECHANICAL ENGINEERING, MS

for the degree of Master of Science in Mechanical Engineering (on campus & online)

The MS in Mechanical Engineering is available for both on-campus and online students. Prospective students planning to continue for the PhD should apply to the PhD program.

Opportunity exists for specializing in i) biomechanics via the Biomechanics (<http://catalog.illinois.edu/graduate/engineering/concentration/biomechanics/>) optional graduate concentration, ii) cancer nanotechnology via the Cancer Nanotechnology (<http://catalog.illinois.edu/graduate/engineering/concentration/cancer-nanotechnology/>) optional graduate concentration, and iii) computational science and engineering via the Computational Science & Engineering (<http://catalog.illinois.edu/graduate/engineering/concentration/computational-science-engineering/>) optional graduate concentration.

## Graduate Teaching Experience

Although teaching is not a general Graduate College requirement, experience in teaching is considered an important part of the graduate experience in both the ME and TAM MS programs.

## Department Research

A new paradigm in research is being created in the department by integrating basic sciences such as biology, chemistry, applied mathematics, and applied physics with the traditional mechanical engineering and engineering mechanics disciplines of fluid mechanics/thermal sciences, solid mechanics/materials and controls/dynamics. This integration is fostering new directions and discoveries in nanomechanics, nanomanufacturing, biomechanics and computational science and engineering.

The goal of all research in the department is to address critical societal problems in the areas of health, security/defense, energy/environment, manufacturing, and transportation. While the basic function of departmental research is generation of new knowledge, a growing number of projects are prompted by current needs of the state of Illinois, the United States, and the world. For more information, see the department's research Web site (<https://mechanical.illinois.edu/research/>).

MechSE faculty are major participants in activities at the department, college, and university level via research centers and programs that are integral to the MechSE graduate program. For more information, see the department's research centers Web site (<https://mechanical.illinois.edu/mechse-research-centers/>).

MechSE's wealth of research laboratories allows faculty, graduate and undergraduate research assistants, and postdoctoral and visiting scholars to conduct theoretical and experimental investigations of phenomena related to materials behavior, combustion, micro- and nanomechanical systems, controls and dynamics, thermodynamics, biomechanics, and much more. For more information, see the department's research laboratories Web site (<https://mechanical.illinois.edu/research/mechse-laboratories/>).

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The online MSME degree program offers both a thesis (32 credit hours) and non-thesis (36 credit hours) option. Online students have five years to complete the degree requirements. The degree awarded through our online program is the exact same degree awarded to on-campus MSME students.

For additional details and requirements refer to the department's graduate program requirements (<http://mechanical.illinois.edu/graduate/>) and the Graduate College Handbook (<http://grad.illinois.edu/gradhandbook/>).

## Thesis Option

Code	Title	Hours
ME 599	Thesis Research (min-max applied toward the degree)	4-8
MSE 492	Lab Safety Fundamentals (credit does not apply toward the degree)	0
ME 590	Seminar (registration for 1 hour every term while in residence; credit does not apply toward the degree)	0
Elective courses (formal graded coursework) – chosen in consultation with advisor (subject to Other Requirements and Conditions below)		24-28
<b>Total Hours</b>		<b>32</b>

## Other Requirements and Conditions (may overlap)

Requirement	Description
A minimum of 8 ME or TAM credit hours with 4 at the 500 level.	
A minimum of 12 500-level credit hours applied toward the degree.	
For the thesis option, a maximum of 4 hours of ME 597 or TAM 597 (or other approved independent study) may be applied toward the elective course work requirement.	
No ME 599 credit may be applied toward the elective course work requirement (599 is not formal graded coursework).	
Minimum GPA:	3.0

## Non-Thesis Option

Code	Title	Hours
MSE 492	Lab Safety Fundamentals (credit does not apply toward the degree)	0
ME 590	Seminar (registration for 1 hour every term while in residence; credit does not apply toward the degree)	0
ME 597 or TAM 597	Independent Study Advanced Independent Study	4

Elective courses – chosen in consultation with advisor (subject to Other Requirements and Conditions below)	32
<b>Total Hours</b>	<b>36</b>

### Other Requirements and Conditions (may overlap)

Requirement	Description
A minimum of 8 ME or TAM credit hours with 4 at the 500 level.	
A minimum of 12 500-level credit hours applied toward the degree.	
Departmental approval is required to pursue the non-thesis option.	
Minimum GPA:	3.0

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Illinois MechSE ME graduates will have:

1. A deep understanding of at least one core area of Mechanical engineering (e.g., mechanics of materials, combustion, controls and dynamics, manufacturing, fluid mechanics, solid mechanics). [MS/PhD]
2. A broader understanding of at least 1-2 areas of Mechanical Engineering that are different from the area of research of the student's thesis. [MS/PhD]
3. Ability to think critically and creatively in defining research questions and to outline strategies of inquiry. [MS/PhD]
4. Ability to document research outcomes comprehensively for publication. [MS/PhD]
5. Ability to communicate research results to scientific audience in conferences. [PhD]
6. Ability to work collaboratively with other peers. [MS/PhD]

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### Admission Requirements

An applicant for admission to the MS program in Mechanical Engineering in the Department of Mechanical Science and Engineering must:

1. Be a graduate of an institution awarding a baccalaureate degree equivalent to that granted by the University of Illinois at Urbana-Champaign;
2. Be adequately prepared for advanced study as demonstrated by his or her previous program of study and scholastic record; and
3. Be recommended for admission by the Department of Mechanical Science and Engineering. A minimum grade point average of 3.25 (A = 4.00) for the last two years of undergraduate study is required, and a minimum grade point average of 3.50 (A = 4.00) is required for any previous graduate work completed.

Currently the Graduate Record Examination (GRE) (<http://www.ets.org/>) is not required for the admissions application, but a student may elect to submit their scores.

All applicants whose native language is not English are required to submit TOEFL (<http://www.toefl.org/>) or International English Language Testing System (IELTS) (<http://www.ielts.org/>) scores as evidence

of English proficiency. Minimum admission requirements (<https://grad.illinois.edu/admissions/instructions/04c/>) are set by the Graduate College. Students applying to the online program must satisfy the full status admissions requirement.

The Department of Mechanical Science and Engineering accepts MS applications for both Spring and Fall terms.

For detailed information, please see our admissions requirements webpage (<https://mechse.illinois.edu/graduate/applying-mechse-graduate-programs/>).

### Financial Aid

Students admitted to the MS program are eligible for Board of Trustees (BOT) tuition-waiver generating assistantships at the University of Illinois. All applicants whose native language is not English, regardless of US citizenship, who wish to be considered for teaching assistantships must demonstrate spoken English language proficiency (<http://grad.illinois.edu/admissions/taengprof.htm>) by achieving a minimum score of 24 on the speaking subsection of the TOEFL iBT or 8.0 on the speaking subsection of the IELTS. Students who are already at Illinois may request to take the on-campus EPI test ([http://cte.illinois.edu/testing/oral\\_eng/epi\\_overview.html](http://cte.illinois.edu/testing/oral_eng/epi_overview.html)), for which the minimum passing score for TA eligibility is 4CP. All new teaching assistants are required to participate in the Graduate Academy for College Teaching (<https://citl.illinois.edu/citl-101/teaching-learning/grad-academy-for-college-teaching/>) prior to the start of their first semester as a teaching assistant.

### Other Graduate Programs in the Department of Mechanical Science & Engineering

- degree programs:
  - Mechanical Engineering, MENG (<http://catalog.illinois.edu/graduate/engineering/mechanical-engineering-meng/>)
    - optional concentrations:
      - Biomechanics (<http://catalog.illinois.edu/graduate/engineering/concentration/biomechanics/>)
      - Cancer Nanotechnology (<http://catalog.illinois.edu/graduate/engineering/concentration/cancer-nanotechnology/>)
  - Mechanical Engineering, PhD (<http://catalog.illinois.edu/graduate/engineering/mechanical-engineering-phd/>)
  - Theoretical & Applied Mechanics, MS (<http://catalog.illinois.edu/graduate/engineering/theoretical-applied-mechanics-ms/>)
  - Theoretical & Applied Mechanics, PhD (<http://catalog.illinois.edu/graduate/engineering/theoretical-applied-mechanics-phd/>)
- optional concentrations for MS and PhD programs:
  - Biomechanics (<http://catalog.illinois.edu/graduate/engineering/concentration/biomechanics/>)
  - Cancer Nanotechnology (<http://catalog.illinois.edu/graduate/engineering/concentration/cancer-nanotechnology/>)
  - Computational Science & Engineering (<http://catalog.illinois.edu/graduate/engineering/concentration/computational-science-engineering/>)

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### Department of Mechanical Science & Engineering

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 Director of Graduate Studies: Petros Sofronis

Contact: Amy Cates ([acate2@illinois.edu](mailto:acate2@illinois.edu))  
Department of Mechanical Science & Engineering Department website (<https://mechanical.illinois.edu/>)  
Program website (<https://mechanical.illinois.edu/graduate/graduate-degree-programs/ms-programs/>)  
Mechanical Science & Engineering Department faculty (<https://mechanical.illinois.edu/people/>)  
168 Mechanical Engineering Building, 1206 West Green Street, Urbana, IL 61801  
(217) 300-6722  
Mechanical Science & Engineering email ([mekhse-grad@illinois.edu](mailto:mekhse-grad@illinois.edu))

**Grainger College of Engineering**

Grainger College of Engineering website (<https://grainger.illinois.edu/>)

**Admissions**

Mechanical Science & Engineering Department Overview of Admissions & Requirements (<https://mechanical.illinois.edu/graduate/applying-mekhse-graduate-programs/>)  
Graduate College Admissions & Requirements (<https://grad.illinois.edu/admissions/apply/>)