

THEORETICAL & APPLIED MECHANICS, MS

for the degree of Master of Science in Theoretical & Applied Mechanics

Prospective students planning to continue for the PhD should apply to the PhD program.

Opportunity exists for specializing in computational science and engineering via the Computational Science & Engineering (<http://catalog.illinois.edu/graduate/engineering/concentration/computational-science-engineering/>) optional graduate concentration.

Admission Requirements

An applicant for admission to 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.

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), 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.

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 PhD programs. The TAM PhD requires that one semester of teaching assistantship be completed during the program.

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 website (<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 website (<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 website (<https://mechanical.illinois.edu/research/mechse-laboratories/>).

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A full-time student can usually complete the program requirements in one academic year of study. A student who has an assistantship can usually complete the requirements in one calendar year.

For additional details and requirements refer to the department's Graduate Program Website (<https://mechse.illinois.edu/graduate/ms-programs/ms-theoretical-and-applied-mechanics/>) and the Graduate College Handbook (<https://grad.illinois.edu/gradhandbook/>).

Thesis Option

Code	Title	Hours
TAM 599	Thesis Research (min-max applied toward the degree)	4-8
TAM 500	Seminar (registration for 1 hour every term while in residence; credit does not apply toward the degree)	0
Elective courses – chosen in consultation with advisor (subject to Other Requirements and Conditions below)		24-28
Total Hours		32

Other Requirements and Conditions

Requirement	Description
MSE 492 Lab Safety Fundamentals	
A minimum of 16 TAM credit hours, with 8 at the 500 level.	
A minimum of 12 500-level credit hours applied toward the degree	
No TAM 599 credit may be applied toward the elective course work requirement.	
A maximum of 4 hours of TAM 597 or ME 597 (or other approved independent study) may be applied toward the elective course work requirement.	
Other Requirements and Conditions may overlap	
Minimum GPA:	3.0

Non-Thesis Option

Code	Title	Hours
TAM 500	Seminar (registration for 1 hour every term while in residence; credit does not apply toward the degree)	0
Elective courses – chosen in consultation with advisor (subject to Other Requirements and Conditions below)		36
Total Hours		36

Other Requirements and Conditions

Requirement	Description
Other Requirements and Conditions may overlap	
A minimum of 16 TAM credit hours, with 8 at the 500 level.	
A minimum of 12 500-level credit hours applied toward the degree	
A maximum of 4 hours of TAM 597 or ME 597 (or other approved independent study) may be applied toward the elective course work requirement.	
Departmental approval is required to pursue the non-thesis option.	
Minimum GPA:	3.0

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Illinois MechSE TAM graduates will have:

1. A thorough understanding of the fundamentals of the engineering disciplines, namely, solid mechanics, fluid mechanics, and applied mathematics (core requirements). [MS/PhD]
2. A broad understanding of the various foundations of the engineering disciplines, including computational mechanics, mechanics of materials, biomechanics, dynamics, and nanomechanics (in the PhD program, breadth requirements). [MS/PhD]
3. Ability to identify relevant research subjects, outline strategies of inquiry, and demonstrate potential to bring the relevant research to completion. [MS/PhD]
4. Ability to communicate research results to scientific audience in conferences. [MS/PhD]
5. Ability to document research outcomes comprehensively for publication. [MS/PhD]

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Department of Mechanical Science and Engineering

Department Head: Anthony Jacobi (a-jacobi@illinois.edu)

Director of Graduate Studies: Elif Ertekin (<http://catalog.illinois.edu/graduate/engineering/theoretical-applied-mechanics-ms/erteekin@illinois.edu>)

Mechanical Science and Engineering Website (<https://mechanical.illinois.edu/>)

MS Program website (<https://mechanical.illinois.edu/graduate/graduate-degree-programs/ms-programs/>)

Mechanical Science and Engineering Faculty (<https://mechanical.illinois.edu/people/>)

Sidney Lu Mechanical Science & Engineering Building
1206 W Green St, Urbana, IL 61801

(217) 300-6722

mechse-grad@illinois.edu

Grainger College of Engineering

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

Admissions

Departmental Admissions & Requirements (<https://mechanical.illinois.edu/graduate/applying-mechse-graduate-programs/>)

Graduate College Admissions & Requirements (<https://grad.illinois.edu/admissions/apply/>)