THEORETICAL & APPLIED MECHANICS, MS

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

department head: Anthony Jacobi (a-jacobi@illinois.edu)
director of graduate studies: P (saif@illinois.edu)etros Sofronis

overview of admissions & requirements: https://
mechanical.illinois.edu/graduate/applying-mechse-graduate-
programs (https://mechanical.illinois.edu/graduate/applying-
mechse-graduate-programs/)

overview of grad college admissions & requirements: https://
grad.illinois.edu/admissions/apply (https://grad.illinois.edu/ admissions/apply/)
department website: https://mechanical.illinois.edu/
program website: https://mechanical.illinois.edu/graduate/
graduate-degree-programs/ms-programs (https://
mechanical.illinois.edu/graduate/graduate-degree-programs/ms-
programs/)
department faculty: https://mechanical.illinois.edu/people (https://
mechanical.illinois.edu/people/)
college website: https://grainger.illinois.edu/
contact: Amy Cates (acate2@illinois.edu)
address: 168 Mechanical Engineering Bldg, 1206 W Green St,
Urbana, IL 61801
phone: (217) 300-6722
email: mechse-grad@illinois.edu

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.

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.

Scores on the Graduate Record Examination (GRE) (http://www.ets.org/)
general test are required of all applicants. Based upon the previous
preparation of the student, prerequisite courses may be specified by the
advisor, but the credit may not be applied toward a degree.

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.

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 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

Information listed in this catalog is current as of 03/2021
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/).

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, MS (http://catalog.illinois.edu/graduate/engineering/mechanical-engineering-ms/)
Mechanical Engineering, PhD (http://catalog.illinois.edu/graduate/engineering/mechanical-engineering-phd/)
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/)

Opportunity also exists for specializing in energy and sustainability engineering via the
Energy and Sustainability Engineering (EaSE) Graduate Certificate Option (http://ease.illinois.edu/)

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

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 (http://mechanical.illinois.edu/graduate/mechse-graduate-degrees/) and the Graduate College Handbook (https://grad.illinois.edu/gradhandbook/).

Thesis Option

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAM 599</td>
<td>Thesis Research (min-max applied toward the degree)</td>
<td>4-8</td>
</tr>
<tr>
<td>TAM 500</td>
<td>Seminar (registration for 1 hour every term while in residence; credit does not apply toward the degree)</td>
<td>0</td>
</tr>
</tbody>
</table>

Elective courses – chosen in consultation with advisor (subject to Other Requirements and Conditions below) 24-28

Total Hours 32

Other Requirements and Conditions

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSE 492</td>
<td>Lab Safety Fundamentals</td>
</tr>
<tr>
<td>A minimum of 16 TAM credit hours, with 8 at the 500 level.</td>
<td></td>
</tr>
<tr>
<td>A minimum of 12 500-level credit hours applied toward the degree</td>
<td></td>
</tr>
<tr>
<td>No TAM 599 credit may be applied toward the elective course work requirement.</td>
<td></td>
</tr>
<tr>
<td>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.</td>
<td></td>
</tr>
</tbody>
</table>

Other Requirements and Conditions may overlap
Minimum GPA: 3.0

Non-Thesis Option

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAM 500</td>
<td>Seminar (registration for 1 hour every term while in residence; credit does not apply toward the degree)</td>
<td>0</td>
</tr>
</tbody>
</table>

Elective courses – chosen in consultation with advisor (subject to Other Requirements and Conditions below) 36

Total Hours 36

Other Requirements and Conditions

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Requirements and Conditions may overlap</td>
<td></td>
</tr>
<tr>
<td>A minimum of 16 TAM credit hours, with 8 at the 500 level.</td>
<td></td>
</tr>
<tr>
<td>A minimum of 12 500-level credit hours applied toward the degree</td>
<td></td>
</tr>
<tr>
<td>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.</td>
<td></td>
</tr>
</tbody>
</table>

Departmental approval is required to pursue the non-thesis option.
Minimum GPA: 3.0

Information listed in this catalog is current as of 03/2021