

MATERIALS SCIENCE & ENGINEERING, BS AND MATERIALS SCIENCE & ENGINEERING, MS

for the joint degrees of Bachelor of Science Major in Materials Science & Engineering and Master of Science in Materials Science & Engineering

department website: https://matse.illinois.edu
department faculty: Materials Science & Engineering Faculty (https://matse.illinois.edu/directory/faculty)
overview of college admissions & requirements: The Grainger College of Engineering (https://grainger.illinois.edu/admissions)
college website: https://engineering.illinois.edu/

Materials science and engineering is the basis for all engineering. Improvements in the quality of life require knowledge of the processing and properties of current materials and the design, development and application of new materials. The Materials Science and Engineering (MatSE) curriculum provides an understanding of the underlying principles of synthesis and processing of materials and of the interrelationships between structure, properties, and processing. Students learn how to create advanced materials and systems required, e.g., for flexible electronic displays and photonics that will change communications technologies, for site specific drug delivery, for self-healing materials, for enabling the transition to a hydrogen-based economy, and for more efficient photovoltaics and nuclear systems for energy production. The curriculum uses concepts from both basic physics and chemistry and provides a detailed knowledge of what makes the materials we use every day behave as they do.

Students in the first two years take courses in general areas of science and engineering as well as courses introducing the concepts in MatSE. In the third year, students study the common, central issues related to MatSE. In the senior year, students focus on an area of MatSE of their greatest interest, providing them with the detailed knowledge to be immediately useful to corporations, become entrepreneurs, or to provide the underpinning knowledge for graduate study. Note: students interested in biomaterials take a specific set of courses to provide them with a background in biology and chemistry while maintaining a strong engineering focus.

A combined B.S.-M.S. Materials Science and Engineering degree program is available. Its admission and course requirements are described in the College of Engineering program information section (https://currentcourses.illinois.edu/undergraduate/engineer) and the department's website.

Admission to the Program
Current Illinois MatSE students with Junior standing and with an overall grade point average (GPA) of at least 3.00 (A = 4.00) may apply for provisional admission to the program. Admission is based on overall academic performance, letters of reference, and statement of purpose. The GRE General Test is not required.

Students provisionally admitted to the program:

- are assigned a graduate academic advisor when admitted.
- must maintain an overall GPA of 3.00 through completion of the B.S. component of the program, in order to remain in the program
- may register for graduate courses and earn graduate hour credits, with approval from their graduate academic advisor, even if they are more than 10 hours from completing the B.S. component
- must earn at least 120 hours of undergraduate credit and satisfy all B.S. requirements of this program to be officially admitted to the Graduate College.

Upon successful completion of the B.S. component, with grades of B or better in the advanced area coursework, and an overall GPA of at least 3.00 in all graduate coursework, students:

- will be officially admitted into the Graduate College
- will be issued letters of admission from the Office of Admissions and Records and the MatSE Department, at which time they will be considered graduate students and assessed graduate tuition the following semester
- may apply or be considered for graduate teaching assistantships and tuition waivers, as well as fellowships and scholarships (in MatSE only) available to graduate students in MatSE.
- must continue to maintain a graduate GPA of 3.00 or better in order to remain in the combined program.

Students in the program are not eligible to continue in the Ph.D. program in MatSE. Students wishing to pursue a Ph.D. must apply separately for admission to that program.

Withdrawal
Students who do not complete all of the 5-year B.S.-M.Eng. degree program requirements may request, by petition to the Graduate College after obtaining approval by their advisor, the department, and the Associate Dean for Undergraduate Programs in the College of Engineering, to have graduate hours earned converted to undergraduate hours and applied toward a traditional B.S. degree in MatSE. Students reverting to the traditional B.S. degree program must satisfy all degree requirements, including completion of the required "area specialty course(s) in a different area" and the stated credit hour requirements. Graduate credit not used to fulfill the B.S. degree requirements will remain on the transcript and may, at some future point, be considered for transfer to another degree program.

Course Requirements

BS Component (120 hours including 3 advanced, graduate level, area courses for at least 9 hours). Note that the BS component of this BS/MS degree is not ABET accredited.

- Same required courses as the traditional BS degree with minimum hours reduced to 120 hours; except MSE 395 is dropped (i.e. 1 hour). At present, students in their fourth or fifth year considering withdrawing from the MS portion of the program should register for MSE 395 in the spring semester, the resulting BS degree would then be ABET accredited. It is anticipated that, in the near future, senior thesis will be accepted by ABET as an appropriate ‘design experience’ when approved, MSE 395 will no longer be required.
- 2 of the required remaining 4 area courses are to be taken at the graduate level (i.e. the students will be held to the course and grading

Information listed in this catalog is current as of 04/2020
requirements of a graduate student). The 3rd advanced level course can be either in the area or in another area as a tech elective.

- Reduction of 7 hours in free electives and 3 hours in tech electives (10 hours).
- Senior thesis to be taken in lieu of MSE 395 and one area course (6 hours total recommended, with 2 being the remaining 2 hours of free electives).
- Student retains one tech elective.
- Overall GPA of 3.5 maintained through completion of BS component of the program and minimum residency requirements satisfied.

MS Component (minimum 24 additional hours of coursework, plus 8 hours of MSE 599 thesis).

- Same overall requirements as for traditional MS with thesis
- At least one 400-500 level course (for the BS or MS) will be a MatSE course from a different area.
- Complete a MS thesis according to MatSE Department requirements; research for the senior thesis will often serve as a beginning for the MS thesis but the student may change thesis advisors.