Materials Science & Engineering

College of Engineering

The Department of Chemical and Materials Engineering offers programs leading to the M.S. and Ph.D. degrees in Materials Science and Engineering, with research specialization in the following areas:

- Ceramics
- Electronic Materials
- Metals and Alloys
- Micro-Materials
- Nanomaterials
- Polymers and Composites
- Surfaces and Interfaces
- Thin Films

Admission Requirements
Admission to the M.S. and Ph.D. degree programs is on a competitive basis, and financial assistance is available through teaching and research assistantships, as well as a limited number of fellowships. Applicants should have a minimum grade point average of 3.0/4.0 on all undergraduate work. Persons with backgrounds in any physical science or engineering discipline are encouraged to apply, as each applicant's qualifications are reviewed individually. Minimum requirements for admission include a bachelor's degree and four semesters of university-level calculus, calculus-based physics, and chemistry. Please note that meeting the minimum requirements does not guarantee admission, as acceptance is on a competitive and space-available basis.

Master of Science

The master's degree is offered under Plan A (thesis option) and Plan B (non-thesis option). Candidates for the degree under Plan A must complete 24 credit hours of course work and submit and defend a thesis that demonstrates research ability. The required course work includes the materials science core (MSE 632, 635, 650, 781) as well as appropriate electives selected in consultation with the Director of Graduate Studies. In certain exceptional cases (as determined by the faculty), a non-thesis M.S. may be undertaken (Plan B). The non-thesis option requires 30 hours of course work that includes the materials science core, and is only available to those students with prior research or industrial experience. For both Plan A and Plan B, at least half of all graduate course work must be at the 600 level or above.

Doctor of Philosophy

The Ph.D. program offers broad training in materials science and engineering while providing options to suit the student's particular interests and designated area of specialization. The student must conduct original and significant research and must submit and defend a dissertation based on that research. Doctoral students complete the materials science core, and work with their doctoral advisory committee to develop a program of elective courses designed to address deficiencies and to enhance the specialization area of interest. In addition, students must demonstrate proficiency in a minor area selected from the fields of mathematics, physical sciences, or engineering.

In order to advance to candidacy, doctoral students must pass an oral qualifying examination that tests the candidate's knowledge in three fundamental areas of Materials Science and Engineering: Structure of Materials, Mechanical Behavior of Materials, and Thermodynamics of Materials. There is no language requirement for the M.S. or Ph.D. degrees in Materials Science and Engineering.

Graduate Courses

MSE 401G	Metal And Alloys	(3)
MSE 402G	Electronic Materials And Processing	(3)
MSE 403G	Ceramic Engineering	(3)
MSE 404G	Polymeric Materials (Same As Cme 404G)	(3)
MSE 506	Mechanics Of Composite Materials (Same As Me 506)	(3)
MSE 531	Powder Metallurgy	(3)
MSE 535	Mechanical Properties Of Materials	(3)
MSE 538	Metals Processing	(3)
MSE 542	Extractive Metallurgy	(4)
MSE 554	Chemical And Physical Processing Of Polymer Systems (Same As CME/ME/MFS 554)	(3)
MSE 556	Introduction To Composite Materials (Same As CME/ME 556)	(3)
MSE 561	Electric And Magnetic Properties Of Materials (Same As EE 561)	(3)
MSE 569	Electronic Packaging Systems And Manufacturing Processes (Same As EE 569)	(3)
MSE 585	Materials Characterization Techniques	(3)
MSE 599	Topics In Materials Science And Engineering	(1-4)
MSE 607	Analysis Of Metal Cutting Processes (Same As Me/MFS 607)	(3)
MSE 620	Computational Materials Science Engineering	(3)
MSE 622	Physics Of Polymers (Same As CME 622)	(3)
MSE 632	Advanced Materials Science	(3)
MSE 635	Advanced Mechanical Metallurgy	(3)
MSE 636	Dislocation Theory	(3)
MSE 650	Advanced Materials Thermodynamics	(3)
MSE 661	Advanced Physical Metallurgy I	(3)
MSE 662	Advanced Physical Metallurgy Ii	(3)
MSE 663	Optoelectronic Devices	(3)
MSE 699	Advanced Topics In Materials Science And Engineering	(3)
MSE 748	Master's Thesis Research	(0)
MSE 749	Dissertation Research	(0)
MSE 767	Dissertation Residency Credit	(2)
MSE 768	Residence Credit For Master's Degree	(1-6)
MSE 769	Residence Credit For Doctor's Degree	(0-12)
MSE 771	Seminar	(0)
MSE 781	Special Problems, Literature And Laboratory	(1-3)
MSE 782	Special Problems, Literature And Laboratory	(3)
MSE 790	Research In Materials Science	(3-9)