

MATERIALS SCIENCE AND ENGINEERING: RESEARCH, M.S.

REQUIREMENTS

MINIMUM GRADUATE SCHOOL REQUIREMENTS

Review the Graduate School minimum academic progress and degree requirements (<http://guide.wisc.edu/graduate/#policiesandrequirements>), in addition to the program requirements listed below.

NAMED OPTION REQUIREMENTS

MODE OF INSTRUCTION

Face to Face	Evening/Weekend	Online	Hybrid	Accelerated
Yes	No	No	No	No

Mode of Instruction Definitions

Accelerated: Accelerated programs are offered at a fast pace that condenses the time to completion. Students are able to complete a program with minimal disruptions to careers and other commitments.

Evening/Weekend: Courses meet on the UW–Madison campus only in evenings and/or on weekends to accommodate typical business schedules. Students have the advantages of face-to-face courses with the flexibility to keep work and other life commitments.

Face-to-Face: Courses typically meet during weekdays on the UW–Madison Campus.

Hybrid: These programs combine face-to-face and online learning formats. Contact the program for more specific information.

Online: These programs are offered 100% online. Some programs may require an on-campus orientation or residency experience, but the courses will be facilitated in an online format.

CURRICULAR REQUIREMENTS

Requirements Detail

Minimum Credit Requirement	30 credits
Minimum Residence Credit Requirement	16 credits
Minimum Graduate Coursework Requirement	15 credits must be graduate-level coursework. Details can be found in the Graduate School's Minimum Graduate Coursework (50%) policy (https://policy.wisc.edu/library/UW-1244 (https://policy.wisc.edu/library/UW-1244/)).
Overall Graduate GPA Requirement	3.00 GPA required. This program follows the Graduate School's GPA Requirement policy

(<https://policy.wisc.edu/library/UW-1203> (<https://policy.wisc.edu/library/UW-1203/>)).

Other Grade Requirements n/a

Assessments and Examinations Students must prepare a Master's thesis, present it in a public seminar, and defend it in closed examination by their Master's committee. The format and procedures must conform to the Graduate School rules for a Master's thesis, currently found at <https://grad.wisc.edu/current-students/masters-guide> (<https://grad.wisc.edu/current-students/masters-guide/>).

Language Requirements None.

REQUIRED COURSES

Code	Title	Credits
Materials Research Seminar ¹		2
M S & E 900	Materials Research Seminar	
Materials Core Courses		9
Select three courses:		
M S & E 521	Advanced Polymeric Materials	
M S & E 530	Thermodynamics of Solids	
M S & E 551	Structure of Materials	
M S & E 752	Advanced Materials Science: Phase Transformations	
<i>Graduate-level Math Course (students may only count one of the following as a Materials Core Course)</i>		
E P/E M A 547	Engineering Analysis I	
CBE 660	Intermediate Problems in Chemical Engineering	
MATH 703	Methods of Applied Mathematics 1	
MATH 704	Methods of Applied Mathematics-2	
PHYSICS 721	Theoretical Physics-Electrodynamics	
Materials Elective Courses		6
Electives must be selected from the list of Materials Elective Courses below.		
Research		13
M S & E 790	Master's Research or Thesis	
Total Credits		30

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Take two consecutive semesters for 1 credit each semester.

Materials Elective Courses:

The same course may not satisfy more than one requirement. For example, if M S & E 530 Thermodynamics of Solids is taken as a Materials Core Course, it could not be used as a Materials Elective Course. In addition, only one mathematics course may be counted as a materials core or materials elective course. Students or faculty may request that a course be added to the list by submitting a letter to the department graduate secretary including the course syllabus and explaining why the course is a materials-centric course.

Code	Title	Credits
M S & E 401	Special Topics in Materials Science and Engineering	1-3

M S & E/CHEM 421	Polymeric Materials	3	CHEM 664	Physical Chemistry of Macromolecules	2-3
M S & E/N E 423	Nuclear Engineering Materials	3	CHEM 721	Instrumental Analysis	3-4
M S & E/N E 433	Principles of Corrosion	3	E C E 745	Solid State Electronics	3
M S & E 434	Introduction to Thin-Film Deposition Processes	3	GEOSCI 765	Crystal Chemistry	3
M S & E 441	Deformation of Solids	3	PHYSICS 415	Thermal Physics	3
M S & E 448	Crystallography and X-Ray Diffraction	3	PHYSICS 551	Solid State Physics	3
M S & E 451	Introduction to Ceramic Materials	3	PHYSICS 715	Statistical Mechanics	3
M S & E 456	Electronic, Optical, and Magnetic Properties of Materials	3	PHYSICS 751	Advanced Solid State Physics	3
M S & E 460	Introduction to Computational Materials Science and Engineering	3			
M S & E 461	Advanced Metal Casting	3			
M S & E/M E 462	Welding Metallurgy	3			
M S & E 463	Materials for Elevated Temperature Service	3			
M S & E 465	Fundamentals of Heat Treatment	3			
M S & E/CIV ENGR/ G L E/GEOSCI 474	Rock Mechanics	3			
M S & E 521	Advanced Polymeric Materials	3			
M S & E 530	Thermodynamics of Solids	3			
M S & E/E M A 541	Heterogeneous and Multiphase Materials	3			
M S & E 551	Structure of Materials	3			
M S & E 553	Nanomaterials & Nanotechnology	3			
M S & E 560	Fundamentals of Atomistic Modeling	3			
M S & E 570	Properties of Solid Surfaces	3			
M S & E 648	Advanced X-ray Scattering Methods in Materials Science and Engineering	3			
M S & E 660	Mesoscale Modeling of Materials	3			
M S & E 748	Structural Analysis of Materials	3			
M S & E 750	Imperfections and Mechanical Properties	3			
M S & E 752	Advanced Materials Science: Phase Transformations	3			
M S & E 756	Structure and Properties of Advanced Electronic Materials	3			
M S & E 760	Molecular Dynamics and Monte Carlo Simulations in Materials Science	3			
M S & E 803	Special Topics in Materials Science	1-3			
B M E/PHM SCI 430	Biological Interactions with Materials	3			
B M E/M E 615	Tissue Mechanics	3			
BIOCHEM/ CHEM 704	Chemical Biology	3			
CBE 540	Polymer Science and Technology	3			
CBE 747	Advanced Colloid and Interface Science	3			
CHEM 652	Chemistry of Inorganic Materials	3			
CHEM 653	Chemistry of Nanoscale Materials	3			
CHEM 654	Materials Chemistry of Polymers	2-3			