MATERIALS SCIENCE AND ENGINEERING: MATERIALS ENGINEERING, MS

REQUIREMENTS

MINIMUM GRADUATE SCHOOL REQUIREMENTS

Review the Graduate School minimum academic progress and degree requirements (http://guide.wisc.edu/graduate/ #policiesandrequirementstext), 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	Yes

Mode of Instruction Definitions

Accelerated: Accelerated programs are offered at a fast pace that condenses the time to completion. Students typically take enough credits aimed at completing the program in a year or two.

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

Requirement	t:Detail
Minimum Credit Requirement	30 credits
Minimum Residence Credit Requirement	16 credits
Minimum Graduate Coursework Requirement	15 credits must be graduate-level coursework. Refer to the Graduate School: Minimum Graduate Coursework (50%) Requirement policy: https://policy.wisc.edu/library/ UW-1244 (https://policy.wisc.edu/library/UW-1244/).

	Overall	3.00 GPA required.
	Graduate	Refer to the Graduate School: Grade Point Average
	GPA	(GPA) Requirement policy: https://policy.wisc.edu/library/
	Requirement	UW-1203 (https://policy.wisc.edu/library/UW-1203/).
	Other Grade Requirements	n/a
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	Assessments and Examinations	No formal examination is required.
	Language	None.

Requirements

REQUIRED COURSES

Code Title		Credits	
General Requirements			
M S & E 900	Materials Research Seminar (2 semesters)	2	
M S & E 350	Introduction to Materials Science	3	
or M S & E 550	Materials Fundamentals		
M S & E 530	Thermodynamics of Solids	3	
Courses within focus area (see below)		22	
Total Credits		30	

Students choose one of the following pathways:

Nanomaterials and Nanoengineering¹

Code Title		Credits
Required course:		
M S & E 553	Nanomaterials & Nanotechnology	3
Electives:		
M S & E 401	Special Topics in Materials Science and Engineering (Energy Storage Materials)	3
M S & E 401	Special Topics in Materials Science and Engineering (Inorganic Organic Hybrid Materials)	3
MS&E/CHEM 421	Polymeric Materials	3
M S & E 434	Introduction to Thin-Film Deposition Processes	3
M S & E 448	Crystallography and X-Ray Diffraction	3
M S & E 456	Electronic, Optical, and Magnetic Properties of Materials	3
M S & E 460	Introduction to Computational Materials Science and Engineering	3
M S & E 521	Advanced Polymeric Materials	3
M S & E 551	Structure of Materials	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 752	Advanced Materials Science: Phase Transformations	3
M S & E 760	Molecular Modeling of Materials	3

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M S & E 699	Independent Study ²	1-4	M S & E 401	Special Topics in Materials Science	3
M S & E 803	Special Topics in Materials Science (with advisor approval)	1-3		and Engineering (Quantum Materials)	
Engineering Materials and Processes ¹			M S & E 448	Crystallography and X-Ray Diffraction	3
Code Required Course:	Title	Credits	M S & E 456	Electronic, Optical, and Magnetic Properties of Materials ³	3
M S & E 752	Advanced Materials Science: Phase	3	M S & E 551	Structure of Materials	3
	Transformations		M S & E 648	Advanced X-ray Scattering	3
Electives:				Methods in Materials Science and	
MS&E/NE 433	Principles of Corrosion	3		Engineering	0
M S & E 441	Deformation of Solids	3	M S & E 660	Mesoscale Modeling of Materials	3
M S & E 461	Advanced Metal Casting	3	M S & E /48	Structural Analysis of Materials	3
MS&E/ME 462	Welding Metallurgy	3	M S & E 756	Structure and Properties of	3
M S & E 463	Materials for Elevated Temperature	3		Advanced Electronic Materials	2
	Service	-	M S & E 760	Molecular Modeling of Materials	1 4
M S & E 465	Fundamentals of Heat Treatment	3	M 5 & E 699	Independent Study	1-4
M S & E 551	Structure of Materials	3	E C E 549	Integrated Circuit Fabrication	4
M S & E 560	Fundamentals of Atomistic Modeling	3		Laboratory	
M S & E 648	Advanced X-ray Scattering Methods in Materials Science and Engineering	3	Computation and Artificial Intelligence in Materials Engineering ¹		als
M S & F 660	Mososcalo Modoling of Matorials	3	Code	Title	Credits
M S & E 699	Independent Study ²	1_1	Required courses:		
M S & E 7/8	Structural Analysis of Matorials	1-4	M S & E 803	Special Topics in Materials Science	3
M S & E 740	Molocular Modeling of Materials	3		(Data Science in Materials)	
	Fundamentals of Tachnical Project	1	M S & E 660	Mesoscale Modeling of Materials	3
EFD 005	Management	I	At least one course fr	rom the following two: ³	
F P D 701	Writing for Professionals	1	M S & E 460	Introduction to Computational	
E P D 702	Professional Presentations	1		Materials Science and Engineering	
E P D 704	Organizational Communication and	1	M S & E 760	Molecular Modeling of Materials	
21 2701	Problem Solving		Electives:	Canadal Tanàna in Mataniala Caisana	2
E P D 706	Change Management	1	M S & E 401	and Engineering (Modern Alloy	3
E P D 708	Creating Breakthrough Innovations	1		Design)	
E P D 712	Ethics for Professionals	1	M S & E 401	Special Topics in Materials Science	3
E P D/GEN BUS/	Marketing for Non-Marketing	1		and Engineering (Quantum	
MARKETNG 782	Professionals			Materials)	
E P D/GEN BUS/ M H R 783	Leading Teams	1	M S & E 456	Electronic, Optical, and Magnetic Properties of Materials	3
or E P D 606	Leading and Managing Technical Teams		M S & E 460	Introduction to Computational Materials Science and Engineering ³	3
Semiconductor Materials and Manufacturing for			M S & E 553	Nanomaterials & Nanotechnology	3
Microelectronic	5	Cuadita	M S & E 699	Independent Study ²	1-4
Code	litle	Credits	M S & E 756	Structure and Properties of	3
Required courses:		2		Advanced Electronic Materials	
M 5 & E 434	Processes	3	M S & E 760 COMP SCI/E C E/	Molecular Modeling of Materials ³ High Performance Computing for	3
M S & E 570	Properties of Solid Surfaces	3	E M A/E P/M E 759	Applications in Engineering	
At least one course from the following three: ³					
M S & E 456	Electronic, Optical, and Magnetic Properties of Materials				с .
M S & E 756	Structure and Properties of Advanced Electronic Materials		unese pathways are internal to the program and represent different curricular paths a student can follow to earn this degree. Pathway names		
M S & E 760	Molecular Modeling of Materials		do not appear in the Graduate School admissions application, and they will not appear on the transcript		and they
Electives: will not appear on the transcript.					

- ² Students in this program may apply a maximum of 4 credits
- of M S & E 699 Independent Study to the degree, with advisor approval.
 ³ The same course may not satisfy more than one requirement. For example, if M S & E 456 Electronic, Optical, and Magnetic Properties of Materials is taken as a required course, it cannot also be used as an elective course.

Other Policy

Students in this program may not take courses outside the prescribed curriculum without faculty advisor and program director approval. Students in this program cannot enroll concurrently in other undergraduate or graduate degree programs.