

University of Wisconsin – Milwaukee
College of Engineering and Applied Science
MATERIALS ENGINEERING CURRICULUM

The minimum number of credits required to complete the Bachelor of Science in Engineering with a major in Materials Engineering is 124 credits. Students who need background preparation courses may need additional credits. See information below regarding placement examinations.

Engineering Core Courses (28 credits)		Credits	Prerequisite
EAS 100	CEAS Freshman Orientation	1	none
EAS 200	Professional Seminar	0	none
Ind Eng 360	Engineering Economic Analysis	3	Jr St
CompSci 151	Introduction to Scientific Programming	3	Math 231 (C)
Civ Eng 201	Statics	3	Math 232
Civ Eng 202	Dynamics	3	Civ Eng 201, Math 233 (C)
Civ Eng 303	Strength of Materials	4	Civ Eng 201, Math 233 (C)
MatlEng 201	Engineering Materials	4	Chem 105 or 102 or 117
ElecEng 306	Introduction to Electrical Engineering	4	Physic 210, ElecEng 234
MechEng 301	Basic Engineering Thermodynamics	3	Math 233, Physics 209

Materials Engineering Major (28 credits)			
MatlEng 330	Materials and Processes in Manufacturing	3	MatlEng 201
MatlEng 390	Senior Design Projects	4	Sr St, Cons Instr
MatlEng 402	Physical Metallurgy	3	Jr St, MatlEng 201
MatlEng 410	Mechanical Behavior of Materials	3	Jr St, MatlEng 201
MatlEng 411	Materials Laboratory	3	Sr St, MatlEng 201
MatlEng 442	Thermodynamics of Materials	3	Jr St, MechEng 301
MatlEng 443	Transport and Kinetics in Materials Processing	3	Jr St, MatlEng 442, ElecEng 234
MatlEng 451	Ceramic and Polymeric Materials	3	Jr St, MatlEng 201
MatlEng 461	Corrosion Engineering	3	Jr St, MatlEng 201

*Mathematics (14-16 credits)		
One of the following Calculus sequences must be completed:		
Math 231-232-233	12	Math placement score, or previous course with at least "C" grade.
Or Math 221- 222 (Honors)	10	
And ElecEng 234 (Analytical Methods in Engineering)	4	Math 233

*Chemistry (5-10 credits)		
One of the following sequences must be completed:		
Chem 105 (Suggested) or Chem 102 -104		Chem 100 with "C" grade or Chemistry placement test

Physics (10 credits)		
Physics 209 & 214 – 210 & 215		See Schedule of Classes

General Education Requirements		
<i>Distribution Requirements (15 credits)</i>		
Art	3	none
Humanities	6	none
Social Science	6	none
One of the arts, humanities, or social science courses selected must also meet the UWM cultural diversity requirement. <i>(Commun 103 Public Speaking or Commun 105 Business and Professional Communication are recommended as part of the distribution requirements)</i>		
Free Elective	4	
<i>Competency Requirements</i>		
*English Composition (0-6 credits)		
The English Composition requirement is satisfied by:		
1. Earning a satisfactory score on the English placement test, or		
2. Earning a grade of C or higher in English 102		
Foreign Language (0-8 credits) (for new freshman starting fall 1999)		
The foreign language requirement can be completed with one of these options:		
1. Two years of a single foreign language in high school		
2. Two semesters of a single foreign language in college		
3. Demonstrate ability by examination		

*Placement Examinations		
Once admitted to UWM, most engineering students are required to take placement examinations in mathematics, English and chemistry. Students with previous college level credits in these areas may not be required to take placement exams. The placement exams are administered by the UWM Testing Center, Mellencamp Hall, room B28, (414) 229-4689. The results of these tests help students determine the appropriate course in which to register. Background prerequisite courses may be required in addition to the courses listed above. Possible Math placements for engineering students are Math 090-095-105-116-117-225-231-221. Possible English placements are English 090-095-101-102. Possible Chemistry placements are Chemistry 100, 102 or 105.		

Technical Electives--Materials Engineering Major

The materials engineering program requires a minimum of 18 credits of technical electives, chosen from the following lists. At least 12 of the credits of technical electives must be from Group A.

Group A Technical Electives: Select at least 4 courses.

		<u>Credits</u>	<u>Prerequisite</u>
Ind Eng 210	Introduction to Design Techniques	3	Soph St
MatlEng 380	Engineering Basis for Materials Selection	3	MatlEng 201
MatlEng 421	Metal Casting Engineering	3	Jr St, MatlEng 201
MatlEng 431	Welding Engineering	3	Jr St, MatlEng 201
ElecEng 367	Introduction to Microprocessors	4	ElecEng 354, CompSci 151 or 152 or 153 or 201
MatlEng 455	Engineering Composites	3	MatlEng 201
MatlEng 465/ MechEng 465	Friction and Wear	3	Jr St, MatlEng 201
MatlEng 471	Heat Treatment of Materials	3	Jr St, MatlEng 201
MatlEng 481	Electronic Materials	3	Jr St, MatlEng 201

Group B Technical Electives: Select no more than 6 credits

Chem 104	General Chemistry and Qualitative Analysis	3	Chem 102
Chem 223	Elementary Quantitative Analysis	4	Chem 104 or 118
Chem 341	Introductory Survey of Organic Chemistry	3	Chem 104 or 118
Civ Eng 401	Intermediate Strength of Materials	3	Jr St, CivEng 303
Civ Eng 502	Experimental Stress Analysis	3	Jr St, CivEng 303
EAS 001	Co-op Work Period	3 ¹	none
English 206	Technical Writing	3	Soph St, Completion of Eng Comp
Ind Eng 101	Fundamentals of Graphics	3	Math 105 (C)
Ind Eng 467	Introductory Statistics for Physical Sciences and Engineering Students	3	Jr St, Math 233
MatlEng 699	Independent Study	3	Jr St, Cons Instr
Math 413	Introduction to Numerical Analysis	3	Jr St, Math 233(C), 234 (C)
MechEng 320	Introduction to Fluid Mechanics	3	MechEng 301, ElecEng 234, Civ Eng 202

Other appropriate courses by permission of the department chair.

¹Students who earn 3 or more credits of Co-op may use 3 of those credits as approved technical electives.

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