

Materials Science and Engineering BS Curriculum Flow Chart

	I Fall	II Spring	III Fall	IV Spring	V Fall	VI Spring	VII Fall	VIII Spring
Mathematics Foundations	Math 221 Calc I 5	Math 222 Calc II (Math 221) 4	Math 234 MultiVarCalc (Math 222) 4	Math 319 or 320 ODE's Linear Alg. (Math 222) 3				
Physics Foundations	Intro to Engineering InterEGR 110 1	Physics I Phys 201, 207 or 247 (Math 221) 5	Physics II Phys 202, 208 or 248 (Phys I) 5	Statistics 324 (Math 222) 3		Engineering Foundations Elective Choose from list 3-4		
Chemistry Foundations	General Chemistry Chem 109 or 103 & 104 4-5	Science Elective Choose from list 3-5			Chem 343 or 341 O-Chem (Gen Chem) 3		Tech Emphasis Elective 3	*Free Elective if credits are needed 2
Structure-Property Rel's			MSE 351 Intro MSE (General Chemistry) 3	MSE 352 Phys Mat (MSE 351) 3	MSE 451 Ceramics (MSE 352) 3	MSE 421 Polymer Materials (O Chem) 3	MSE 441 Deformation (MSE 352) 3	Tech Emphasis Elective 3
Emphasis Areas			MSE 360 Intro Lab 351 Concur 1	MSE 361 Lab 2 (MSE 360, 352 Concur) 2	MSE 362 Lab 3 (MSE 361) 2	MSE 331 Transport (MSE 330) 3	MSE 456 EOM Properties (Physics II, MSE 352) 3	Tech Emphasis Elective 3
Thermo. Transport, Processing			MSE 330 Thermo (Chemistry & Math 222) 4		MSE 332 Macro- Processing (MSE 330) 3	MSE 333 Micro- Processing (MSE 332) 3	MSE Emphasis Elective (MSE Core) 3	MSE Emphasis Elective (MSE Core) 3
Professional Skills	Comm A 3 ENG 100, LSC 100, CA 100 or ESL 118				*Free Elective if credits are needed 2		MSE 470 Capstone Project I 1	MSE 471 Capstone Project II 3
Liberal Studies	Liberal Studies 3	Liberal Studies 3		Liberal Studies 4	Liberal Studies 3	Liberal Studies 3	Eng and Society Elective 3	EPD 397 Technical Writing 3
Credits	16-17	15-17	17	15	14-16	15-16	16	15-17

Materials Courses

*It is possible to fulfill the subject requirements with 124 credits of course work. Free electives credits encourage students to choose electives based on content and personal interest rather than credit load. 128 credits of coursework are required for the degree.

Materials Science and Engineering BS Degree Requirements

for students beginning in or after Fall 2017

Underpinning Mathematics/Science: (min 40 cr)

Mathematics (16 cr)

Math 221	Calculus and Analytical Geometry
Math 222	Calculus and Analytical Geometry
Math 234	Calculus-Functions of Several Variables
Math 319	Ordinary Differential Equations (DEQs)
	or Math 320 Linear Algebra and DEQs

Statistics (3 cr)

Stat 324	Introductory Applied Statistics for Engineers
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Physics (10 cr)

Phys 201	or Phys 207 or Phys 247 General Physics I
	or EMA 201 and EMA 202
Phys 202	or Phys 208 or Phys 248 General Physics II

Chemistry (min 8 cr)

Chem 109	Advanced General Chemistry
	or Chem 103 & 104 General Chemistry
Chem 343	Introductory Organic Chemistry
	or Chem 341, also Intro Organic Chemistry

Science Elective (min 3 cr) Select one of:

Chem 311	Chemistry Across the Periodic Table
Chem 327	Fundamentals of Analytical Science
Chem 329	Fundamentals of Analytical Science
Chem 345	Intermediate Organic Chemistry
Geol 203	Earth Materials
Phys 205	Modern Physics for Engineers
Phys/ECE 235	Introduction to Solid State Electronics
Phys 241	Intro to Modern Physics
Phys 244	Intro to Modern Physics
Biology 101	Animal Biology
Biology 151	Introductory Biology
Zoology 153	Introductory Biology

Engineering Electives: (min 7 cr)

Intro to Engineering Elective: InterEGR 110 1 cr.

Engineering Foundations Elective (min 3 cr) Select one of:

CBE 255	Introduction to Chemical Process Modeling
CS 200, 300 or 400	Programming I, II or III*
CS 310	Problem Solving Using Computers
ECE 230	Circuit Analysis
ECE 376	Electrical and Electronic Circuits
EMA 303	Mechanics of Materials
Phys 321	Electric Circuits and Electronics
Stat 424	Statistical Experimental Design for Eng's

Engineering and Society Elective. (3 cr) Select one of:

Zoo/Bot/EnvSt	Introductory Ecology, 3 cr
CEE 491	Legal Aspects of Engineering
Envir St 171	Global Change
Envir St 343	Environmental Economics
Envir St 367	Renewable Energy Systems
Envir St 410	Minerals as a Public Problem
Envir St 411	Energy Resources
ISyE 313	Engineering Economic Analysis
ISyE 349	Introduction to Human Factors
Philos 241	Introduction to Ethics
Philos 243	Ethics in Business
Philos 341	Contemporary Moral Issues

* Among CS options, 310 is most recommended. 300 may alternatively be of interest to students emphasizing computational materials science. 200 or 400 may be substituted for 300 depending on prior CS experience.

MSE Disciplinary Core Courses: (40 cr)

MSE 330	Thermodynamics of Materials
MSE 331	Transport Phenomena in Materials
MSE 332	Macroprocessing of Materials
MSE 333	Microprocessing of Materials
MSE 351	Mat Sci-Structure Property Relationships
MSE 352	Materials Science-Transformation of Solids
MSE 360	Materials Laboratory I
MSE 361	Materials Laboratory II
MSE 362	Materials Laboratory III
MSE 421	Introduction to Polymer Materials
MSE 441	Deformation of Solids
MSE 451	Introduction to Ceramic Materials
MSE 456	Electrical, Optical and Magnetic Properties
MSE 470	Capstone Project I
MSE 471	Capstone Project II

Materials Emphasis Electives: (15 cr)

Select 6 credits of MSE courses numbered 400 or above. These courses constitute the MSE portion of the Emphasis Electives on the curriculum flow chart.

Select 9 additional credits of science and engineering coursework. These can come from MS&E courses numbered 400 or above, other engineering courses numbered 300 or above, science courses numbered 300 or above, or up to 3 credits of MS&E 001 Co-op.

Taken together, the above 15 credits of courses constitute the MSE Emphasis Electives on the curriculum flow chart. MS&E faculty advisor approval of the set of selections is required. Course sets may be broad-based or concentrated in a sub-field of materials science and engineering. See department for example materials emphasis elective course sets.

Additional College and University Requirements: (22 cr)

Communications (6 cr)

EPD 397	Technical Communication
Comm A	ENG 100, LSC 100, COM ARTS 100 or ESL 118

Liberal Studies Electives (16 cr).

Same as College of Engineering Liberal Studies Elective requirements.

Credit Minimum for Graduation: 128 cr

The above subject requirements can be met with 124 credits of UW courses. Students must complete 128 credits of course work to earn the Bachelor of Science degree. The 4 elective credits maybe earned by choosing elective courses that carry more credits than the requirement's minimum credit load or by taking any additional courses of the student's choice.

Notes:

- Except for the liberal studies requirements, the same course credits may be applied to only degree elective requirement. MS&E follows the College of Engineering policies with regard to application of liberal studies credits across the liberal studies requirements.
- Students who completed Stat 242 prior to entry into the MSE degree program may use it to fulfill the statistics requirement. All other students must take Stat 224 or 324. This exception is made because students cannot receive credit for Stat 242 and Stat 224 or 324 simultaneously..