Materials Science and Engineering BS Curriculum Flow Chart

I Fall
- Math 221 Calc I

II Spring
- Math 222 Calc II (Math 221)
- Physics I Phys 201, 207 or 247 (Math 221)

III Fall
- Physics II Phys 202, 208 or 248 (Math 222)
- Math 234 MultiVarCalc (Math 222)

IV Spring
- Statistics 324 (Math 222)

V Fall
- Math 319 ODE’s (Math 222)

VI Spring
- MSE 470 Capstone Project I

VII Fall
- MSE 471 Capstone Project II

VIII Spring
- Tech Emphasis Elective

*Free Elective if credits are needed

Mathematics Foundations
- Intro to Engineering
- Engineering Foundations Elective
- Choose from list

Physics Foundations
- Physics I Phys 201, 207 or 247
- Physics II Phys 202, 208 or 248

Chemistry Foundations
- General Chemistry
- Chem 109 or 103 &104

Professional Skills
- Comm A
- ENG 100, CA 100, or LSC 100

Thermo. Transport Processing
- MSE 330 Thermo

Materials Courses
- MSE 351 Intro MSE
- MSE 352 Phys Mat
- MSE 451 Ceramics
- MSE 421 Polymer Materials
- MSE 351 Concurren
- MSE 360 Intro Lab
- MSE 361 Lab 2
- MSE 362 Lab 3
- MSE 331 Transport

Emphasis Areas
- MSE 332 Macro-Processing
- MSE 333 Micro-Processing
- MSE 441 Deformation
- MSE 456 EOM Properties
- MSE 332 Micro-Processing
- MSE 333 Micro-Processing (MSE Core)
- MSE 441 Deformation (MSE 352)

Flexible Electives
- MSE 456 EOM Properties (Physics II, MSE 352)
- MSE 441 Deformation (MSE 352)

Engineering Foundations Elective
- Choose from list

Tech Emphasis Elective

Credits
- 16-18
- 15-17
- 17
- 15
- 14-17
- 15-16
- 16
- 15-17

*It is possible to fulfill the subject requirements with 123 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 2011

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

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 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

Engineering Electives: (min 7 cr)
Intro to Engineering Elective (min 1 cr)
Select one course from the CoE pre-approved list of Introduction to Engineering courses.

Engineering Foundations Elective (min 3 cr).
Select one of:
- CBE 255 Introduction to Chemical Process Modeling
- CS 302 Intro to Object Oriented Programming
- 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:
- Biology 260 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

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.

Additional MS&E 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: (23 cr)
Communications (5 cr)
- EPD 397 Technical Communication
- EPD 155 or other Comm A course

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 123 credits of UW courses. Students must complete 128 credits of course work to earn the Bachelor of Science degree. The 5 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 324. This exception is made because students cannot receive credit for Stat 242 and Stat 324 simultaneously.