

# MATERIALS SCIENCE AND ENGINEERING (MSE) 40 CU

## Course Planning Guide

Entered Fall 2005 and after

### Math (5 CU)

MATH 104  
MATH 114  
MATH 240  
MATH 241 (MSE 515 may replace)  
Mathematics

### Natural Science (7 CU)

PHYS 140  
PHYS 141  
CHEM 101 (link re: CHEM 091 credit)  
CHEM 053  
CHEM 102  
CHEM 054  
MSE 221 OR PHYS 240  
Natural Science (link to allowed courses)

### Engineering (13 CU)

MSE 215  
MSE 220  
MSE 250  
MSE 260  
MSE 360  
MSE 393  
MSE 430\*  
MSE 440  
MSE 495  
MSE 496  
Engineering  
Engineering  
Engineering

\* MSE 330 may be substituted for MSE 430 by students entering in Fall 2005 and before. It is highly recommended that both courses be taken.

### Tech Elective (5 CU)

(Includes any Engineering, Math or Natural Science)  
Tech Elective  
Tech Elective  
Tech Elective  
Tech Elective  
Tech Elective

Highly recommended: MSE 330, 405, and 455.

Approval by petition required to use EAS 445 and 446 as a Technical Elective.

ESE 115 can be used as an Engineering or Technical Elective.

### Social Sci & Humanities (7 CU)

SS  
SS  
H  
H  
SS or H  
SS, H, or TBS  
SS, H, or TBS

THE FOLLOWING REQTS MUST BE SATISFIED FROM THE SSH COURSES ABOVE (Approval required)

### SSH Depth Requirement

Two courses in one SSH subject area  
SSH Depth Req  
SSH Depth Req

### Writing Requirement

One Writing Seminar

### Free Elective (3 CU)

(Approval required)

Free Elective  
Free Elective  
Free Elective

CHEM 091 credit via AP exam

If a student has Chem 091 credit, then SEAS will allow this to be used in CHEM 101 requirement WITHOUT credit. If a student wants the actual credit for CHEM 101, then they must take the Chemistry Department placement/"upgrade" exam.

# Natural Science Courses

The following courses can be used to fulfill the science requirement.

- Astronomy and Astrophysics: 11, 12, 111, 250, 390, 410, 411, 412 (Note: Astronomy 1 may not be taken by Penn Engineering students. Other courses numbered below Astronomy 11 can be taken as free electives only.)
- Biochemistry: Any course
- Bioengineering : 305, 505, 513
- Biological Basis of Behavior: Any course except 227
- Biology: 91 and any course numbered above 100 except 130, 446, and 544
- Biophysics: Any course
- Cellular and Molecular Biology: Any course
- Chemistry: Any course except Chem 11, 12, 22, 23; Note that AP credit for CHEM 091 is accepted in some curricula in lieu of CHEM 101 - check with your Undergraduate Curriculum Chair.
- Engineering and Applied Science: 210.
- Genomics and Computational Biology: Any course
- Geology: 109, 130 and any course above 200
- Materials Science Engineering: MSE 215, 221, 260, 330, 430. These courses may be counted as either science or engineering courses.
- Mechanical Engineering and Applied Mechanics: 110, 147
- Physics: 050, 051, 093, 094, 140, 141, and courses numbered 150 and above, except 500
- Freshman Seminar courses cannot be used to fulfill the natural science requirement.