MATERIALS SCIENCE AND ENGINEERING DEGREE

Students must also complete the Undergraduate Registration Requirement (https://catalogs.northwestern.edu/undergraduate/requirements-policies/undergraduate-registration-requirement) and the degree requirements of their home school.

Course Requirements (48 units)

Core Courses (32 units)

4 mathematics courses (https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext)

4 engineering analysis and computer proficiency courses (https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext)

4 units of basic science:

PHYSICS 135-2 General Physics
& PHYSICS 135-3 General Physics
& PHYSICS 136-2 General Physics Laboratory
& PHYSICS 136-3 General Physics Laboratory

or PHYSICS 140-2 Fundamentals of Physics
& PHYSICS 140-3 Fundamentals of Physics

CHEM 131-0 General Chemistry 1
& CHEM 141-0 and General Chemistry Laboratory 1
& CHEM 132-0 and General Chemistry 2
& CHEM 142-0 and General Chemistry Laboratory 2

or CHEM 151-0 Accelerated General Chemistry 1
& CHEM 152-0 and Accelerated General Chemistry Laboratory 1
& CHEM 161-0 and Accelerated General Chemistry 2
& CHEM 162-0 and Accelerated General Chemistry Laboratory 2

or CHEM 171-0 Advanced General Inorganic Chemistry
& CHEM 181-0 and Advanced General Inorganic Chemistry
& CHEM 172-0 Laboratory
& CHEM 182-0 and Advanced General Physical Chemistry Laboratory

3 design and communications courses (https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext)

5 basic engineering courses:

CIV_ENV 216-0 Mechanics of Materials I
MAT_SCI 301-0 Materials Science Principles
MAT_SCI 314-0 Thermodynamics of Materials
MAT_SCI 315-0 Phase Equilibria & Diffusion of Materials

1 additional course from the remaining 5 McCormick basic engineering categories: Computer architecture and numerical methods, Computer programming, Electrical science, Probability, statistics and quality control, and Systems engineering and analysis (https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext)

7 social sciences/humanities courses (https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext)

5 unrestricted electives (https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext)

Major Program (16 units)

11 required courses:

MAT_SCI 316-1 Microstructural Dynamics
& MAT_SCI 316-2 and Microstructural Dynamics
MAT_SCI 331-0 Soft Materials
MAT_SCI 332-0 Mechanical Behavior of Solids
MAT_SCI 351-1 Introductory Physics of Materials
& MAT_SCI 351-2 and Introductory Physics of Materials
MAT_SCI 361-0 Crystallography & Diffraction
MAT_SCI 390-0 Materials Design

Technical Electives

- 5 technical electives in engineering, natural sciences (usually chemistry or physics), and mathematics chosen to fulfill an area of concentration
  - No more than 2 of the 5 units may be 200-level courses.
  - At least 2 of the 5 must be 300-level materials science and engineering courses.
  - Examples of programs for concentrations in biomaterials, design and manufacturing, electronic materials, metals and ceramics, nanomaterials, polymeric materials, surface science, and sustainable materials are described in a departmental manual for degree candidates.
  - No more than 1 unit of MAT_SCI 394-0 Honors Project in Materials Science or MAT_SCI 399-0 Projects may be counted.

1 See general requirements (https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext) for details.

2 PHYSICS 140-2 Fundamentals of Physics may substitute for PHYSICS 135-2 General Physics. PHYSICS 140-3 Fundamentals of Physics may substitute for PHYSICS 135-3 General Physics. Associated labs are PHYSICS 136-2 General Physics Laboratory and PHYSICS 136-3 General Physics Laboratory.