

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.

Requirements (48 units)

Core Courses (27 units)¹

Course **Title**
4 mathematics courses (<https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext>)

4 units of basic science:²

PHYSICS 135-2
& PHYSICS 135-3 General Physics
and General Physics

CHEM 131-0
& CHEM 132-0 Fundamentals of Chemistry I
and Fundamentals of Chemistry II

or CHEM 151-0
& CHEM 152-0 General Chemistry I
and General Chemistry II

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

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

3 design and communications courses (<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 (21 units)

Course **Title**

15 required courses:

CIV_ENV 216-0 Mechanics of Materials I

MAT_SCI 301-0 Introduction to Materials Science and Engineering
Principles

MAT_SCI 314-0 Thermodynamics of Materials

MAT_SCI 315-0 Phase Equilibria & Diffusion of Materials

MAT_SCI 316-1
& MAT_SCI 316-2 Microstructural Dynamics
and Microstructural Dynamics

MAT_SCI 331-0 Soft Materials

MAT_SCI 332-0 Mechanical Behavior of Solids

MAT_SCI 351-1
& MAT_SCI 351-2 Introductory Physics of Materials
and Introductory Physics of Materials

MAT_SCI 361-0 Crystallography & Diffraction

MAT_SCI 390-0 Materials Design

MAT_SCI 391-0 Process Design

MAT_SCI 396-1
& MAT_SCI 396-2 Senior Project in Materials Science and Engineering
and Senior Project in Materials Science and
Engineering

6 technical elective courses in engineering, natural sciences (usually chemistry or physics), and mathematics chosen to fulfill an area of concentration

No more than 3 of the 6 units may be 200-level courses.

At least 2 of the 6 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 125-2 General Physics for ISP or PHYSICS 140-3 Fundamentals of Physics may be substituted for PHYSICS 135-2 General Physics. PHYSICS 125-3 General Physics for ISP or PHYSICS 140-3 Fundamentals of Physics may be substituted for PHYSICS 135-3 General Physics. Associated labs are PHYSICS 126-2 Physics Laboratory for ISP or PHYSICS 136-2 General Physics Laboratory and PHYSICS 126-3 Physics Laboratory for ISP or PHYSICS 136-3 General Physics Laboratory.