Materials Science and Engineering, Minor

The interdisciplinary field of materials science and engineering has become critical to many emerging areas of advanced technology and their applications. As a result, there are needs and opportunities for engineers and scientists with education and training in materials science and engineering. The goal of the minor in Materials Science and Engineering (MSE) is to provide students at UCI with such education and training that will enable them, upon graduation, to not only participate in projects or programs of an interdisciplinary nature but also address challenging societal needs and complex technological advances.

Students are required to complete all prerequisites for required courses and selected electives. In particular, students need to complete the following courses before applying:

- CHEM 1A General Chemistry
- CHEM 1LE Accelerated General Chemistry Lab
- MATH 2D Multivariable Calculus I
- MATH 2E Multivariable Calculus II
- MATH 3A Introduction to Linear Algebra
- MATH 3D Elementary Differential Equations
- PHYSICS 7C Classical Physics
- PHYSICS 7LC Classical Physics Laboratory
- PHYSICS 7D Classical Physics
- PHYSICS 7LD Classical Physics Laboratory

The Materials Science and Engineering minor requires a total of seven courses—five required courses and two electives:

**Required courses:**
- ENGR 54 Principles of Materials Science and Engineering
- MSE 165C Materials Kinetics and Phase Transformations
- Select three of the following:
  - MSE 69 Electronic and Optical Properties in Materials
  - MSE 151 Polymeric Materials
  - MSE 155 Mechanical Behavior and Design Principles
  - MSE 158 Ceramic Materials for Sustainable Energy
  - MSE 164 X-ray Diffraction, Electron Microscopy, and Microanalysis
  - MSE 165A Thermodynamics of Materials
  - MSE 165B Diffusion and Heat Transport in Materials
  - MSE 175 Design Failure Investigation
  - MSE 190 Materials Selection and Design

**Electives:**
- Select two of the following:
  - BME 110B Biomechanics II
  - BME 111 Design of Biomaterials
  - BME 120 Sensory Motor Systems
  - CBE 187 Semiconductor Device Packaging
  - EECS 170A Electronics I
  - EECS 174 Semiconductor Devices
  - EECS 176 Fundamentals of Solid-State Electronics and Materials
  - ENGR 165 Advanced Manufacturing
  - ENGRMAE 114 Fuel Cell Fundamentals and Technology
  - ENGRMAE 117 Solar and Renewable Energy Systems
  - ENGRMAE 118 Sustainable Energy Systems
  - ENGRMAE 145 Theory of Machines and Mechanisms
  - ENGRMAE 147 Vibrations
  - ENGRMAE 151 Mechanical Engineering Design
  - ENGRMAE 153 Advanced BIOMEMS Manufacturing Techniques
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<td>Composite Materials and Structures</td>
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<td>Green Engineering: Theory and Practice</td>
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<td>MSE 173</td>
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