

# MATERIALS ENGINEERING



Nearly all technological progress requires the ability to engineer materials to meet specific needs. Materials engineers study the relationships between the underlying structure, processing, properties and performance of materials and employ this insight to formulate new or improved materials for use across a variety of industries. The modern materials engineering discipline encompasses metals, ceramics, polymers and composites, electronic materials and biomaterials. Materials characterization—the use of state-of-the-art instruments to determine material composition and structure—plays a key role in materials engineering practice.

## FOR MORE INFORMATION, VISIT THESE WEBSITES:

**Materials Engineering:** [www.engr.uky.edu/cme](http://www.engr.uky.edu/cme) **College of Engineering:** [www.engr.uky.edu](http://www.engr.uky.edu)

**University of Kentucky:** [www.uky.edu](http://www.uky.edu)

**Admissions:** [www.uky.edu/admissions](http://www.uky.edu/admissions)

**Visit Engineering:** [www.engr.uky.edu/visit](http://www.engr.uky.edu/visit)

**Scholarships:** [www.uky.edu/scholarships](http://www.uky.edu/scholarships)

## Materials Engineering Curriculum Sample

This is a sample list of classes a student will take to pursue a degree in materials engineering. In addition to the materials engineering curriculum, students must complete the pre-engineering requirements and general education coursework, called UK Core.

Note: This sample represents one of several paths to a College of Engineering degree. Consult the departmental website for details on specific paths.

### Freshman Year

Engineering Exploration I and II	3
Fundamentals of Engineering Computing	2
Calculus I and II	8
Composition & Communication I and II	6
Chemistry I and Physics I and Labs	10
UK Core Course	3
<b>Total hours</b>	<b>32</b>

### Sophomore Year

Materials Science I and II and Lab	7
Calculus III and IV	7
Physics II	4
Chemistry II and Lab	5
Survey of Organic Chemistry	3
Materials Thermodynamics	3
Statics	3
<b>Total hours</b>	<b>32</b>

### Junior Year

Metals & Alloys	3
Polymeric Materials	3
Process Principles	3
Mechanics of Deformable Solids	3
Engineering Statistics	3
Ceramic Engineering and Processing	3
Electronic Materials and Processing	3
Principles of Modern Physics	3
Mechanical Properties of Materials	3
Materials Lab I	3
UK Core Course	3
<b>Total hours</b>	<b>33</b>

### Senior Year

Materials Characterization Techniques	3
Material Failure Analysis	3
Electrical Circuits & Electronics	3
Materials Design	3
Application of Materials Engr to Design Problems	1
Metals Processing	3
Materials Lab II	3
Technical Electives	6
UK Core Courses	6
<b>Total hours</b>	<b>31</b>

## Pursuing Materials Engineering at UK

Students enrolled in materials engineering at the University of Kentucky enjoy the benefits of studying at the Commonwealth's flagship research institution with an energetic faculty committed to each individual student's educational and professional success. Materials engineering faculty members are readily accessible inside and outside the classroom. Students are encouraged to grow personally and professionally through hands-on research projects, industrial cooperative education and service opportunities. Our alumni follow diverse paths; while many enter industrial positions, others pursue advanced engineering and professional degrees at prestigious institutions across the nation.

### Career Prospects in Materials Engineering

Materials engineers are responsible for the selection, preparation and implementation of existing materials and for the development of new and improved materials. They work at the forefront of rapidly changing technical areas where the application of novel, precisely engineered materials is crucial for technological advancement. Materials engineers are critical to all areas of engineering endeavors, and the College of Engineering at UK has a high placement rate for its materials engineering graduates. Our alumni work in a wide range of materials-related industries, including metals and metals processing; ceramics and electronic materials; biomaterials, implants and medical devices; automotive, aerospace, construction and telecommunications; military and security applications; sports and recreational products.

### Undergraduate Research in Materials Engineering

Materials engineering faculty members engage in a wide range of research activities and welcome undergraduate students into their laboratories as partners in the study of new materials, novel processes and next-generation materials applications. Areas of strong research within the program include batteries and energy storage, computational materials science, metals and advanced alloys, nanomaterials, polymers, soft materials and interfaces, and thin films.

The University of Kentucky's materials engineering program is accredited by the Engineering Accreditation Commission of ABET, [www.abet.org](http://www.abet.org).

**Revised August 2018.** Information subject to change. For the most up-to-date information on the UK College of Engineering, visit [www.engr.uky.edu](http://www.engr.uky.edu).