What can I do with a major in...

Materials science and engineering

ACTIVITIES MATERIALS SCIENCE AND ENGINEERING MAJORS DO:
Materials engineers are involved in the extraction, development, processing, and testing of the materials used to create a diversity of products, from computer chips and television screens to golf clubs and snow skis. They work with metals, ceramics, plastics, semiconductors, and combinations of materials called composites to create new materials that meet certain mechanical, electrical, and chemical requirements. They also are involved in selecting materials for new applications. There are numerous new developments within materials engineering that make it possible to manipulate and use materials in various ways. Materials engineers evaluate economic factors and use their knowledge to develop materials that can be used, for example, to reduce weight but not strength. Materials engineers have developed the ability to create and study materials at an atomic level using advanced processes, electrons, neutrons, or x-rays, and to replicate the characteristics of materials and their components with computers. Development of new materials is a primary objective of materials scientists, and they are largely responsible for the composite materials on stealth aircraft and other cutting-edge systems.

Many materials scientists are involved in mining and the extraction of substances from natural ores. Mining engineers inspect and ensure the safety of miners in underground and open-pit mines. They also locate and appraise new ore deposits and supervise the construction of mine shafts. Mining engineers often develop methods for extracting ores from the mines and monitor operating costs.

A bachelor’s degree is the minimum educational requirement, and many research jobs in materials science require a master’s or Ph.D.

INDUSTRIES MATERIALS SCIENCE AND ENGINEERING MAJORS WORK IN (SAMPLE LISTING):
- Chemical products
- Consulting
- Packaging engineering
- Petroleum
- Paper making
- Consumer products
- Pharmaceuticals
- Marketing
- Healthcare
- Aerospace
- Government
- Semiconductors
- Industrial gas

EMPLOYERS WHO HIRE MATERIALS SCIENCE AND ENGINEERING MAJORS (SAMPLE LISTING):
- 3M
- Accenture
- Polar Semiconductor, LLC
- Pentair, Inc.
- Boston Scientific
- General Mills
- ExxonMobil
- Medtronic
- Ingersoll-Rand
- Ecolab
- Ford Motor Company
- U.S. Department of Energy
- Hormel Foods Corporation
- Seagate Technology
- Valspar
- Cargill
- Honeywell
- Boeing
- Applied Materials, Inc.
- Anderson Corporation

TYPES OF POSITIONS FOR MATERIALS SCIENCE AND ENGINEERING MAJORS (SAMPLE LISTING):
- **Mining engineer**: Plans mining operations, designs underground and surface mines, designs mining equipment, and supervises technicians and workers.
- **Materials consultant**: Serves as expert in one area of materials and is familiar with past experiments and theories related to the hiring firm’s proposed project.
- **Project engineer**: Organizes and runs projects for engineering companies. This can be anything from managing a small modification to an existing pharmaceutical facility to building a multi-billion dollar petrochemicals complex.
- **Design engineer**: Responsible for determining how the process will work. For example, design engineers may decide which pieces of equipment will be needed and how big they will be.
TYPES OF POSITIONS FOR MATERIALS SCIENCE AND ENGINEERING MAJORS (Continued):

- **Operations engineer**: Works “on site,” spending time ensuring that the plant is producing the right amount of product to the correct specification.
- **Research and development (R&D) engineer**: Develops ideas for future plants, improving efficiency, environmental performance, and even developing new products.
- **Product engineer**: Follows the production cycle of a particular product to ensure it is meeting specification. Product engineers may work with marketing and R&D to ensure that a product will meet the needs of customers, then sees the product through production. They may work on new products or variations of existing products.
- **Sales and marketing engineer**: Assists customers in solving production and process problems by providing products and services to meet their specific needs. Chemical engineers in sales use their technical knowledge to sell chemicals, equipment, and other products, and they provide follow-up services and training where needed.

**Some of these positions may require an advanced degree.**

USEFUL WEBSITES FOR MATERIALS SCIENCE AND ENGINEERING MAJORS:

- Department of Chemical Engineering and Materials Science: [cems.umn.edu](http://cems.umn.edu)
- Career Cornerstone Materials Science and Engineering: [careercornerstone.org](http://careercornerstone.org)
- Materials Jobs: [materialsjobs.com](http://materialsjobs.com)
- Chemical Engineering Jobs: [chemicalengineer.com](http://chemicalengineer.com)
- Chemical Engineering Magazine: [che.com](http://che.com)

USEFUL WEBSITES FOR ENGINEERING MAJORS:

- Engineer.net: [engineer.net](http://engineer.net)
- Engineer Jobs: [engineerjobs.com](http://engineerjobs.com)
- Engineering Central: [engcen.com](http://engcen.com)
- Graduating Engineer: [graduatingengineer.com](http://graduatingengineer.com)
- ThinkJobs.com: [thinkjobs.com](http://thinkjobs.com)
- Engineering.com: [engineering.com](http://engineering.com)
- Engineer Info: [engineer.info](http://engineer.info)

PROFESSIONAL ORGANIZATIONS:

- American Institute of Mining, Metallurgical and Petroleum Engineers: [aimehq.org](http://aimehq.org)
- American Society for Testing and Materials: [astm.org](http://astm.org)
- Society for Mining, Metallurgy, and Exploration: [smenet.org](http://smenet.org)
- Association for Iron and Steel Technology: [aist.org](http://aist.org)
- American Institute of Chemical Engineers: [aiche.org](http://aiche.org)
- Society of Petroleum Engineers: [spe.org](http://spe.org)
- Society of Plastics Engineers: [4spe.org](http://4spe.org)
- Institute of Materials, Minerals, and Mining: [iom3.org](http://iom3.org)
- Materials Research Society: [mrs.org](http://mrs.org)
- American Council of Engineering Companies-MN chapter: [acecmn.org](http://acecmn.org)
- National Society of Professional Engineers: [nspe.org/index.html](http://nspe.org/index.html)
- Minnesota Society of Professional Engineers: [mnspe.org](http://mnspe.org)
- Society of Women Engineers: [swe.org](http://swe.org)

*Additional job/internship search websites and resources can be found at cse.umn.edu/career.*

Information on this page was compiled from the Occupational Outlook Handbook, the Encyclopedia of Careers and Vocational Guidance, University of Minnesota departmental websites, and student-reported data.