



Materials Matter

Everything we see and use is made from materials derived from the earth, and advanced materials are essential to nearly every modern technology. Materials Science and Engineering is the broad interdisciplinary field that uses the principles of physics, chemistry, biology, and engineering to develop better, safer and more sustainable materials. Materials engineers study the structures and properties of all types of materials – metals, polymers, ceramics, semiconductors and composites – and develop new ways to make them using nanotechnology and advanced manufacturing techniques.

Materials engineers have a vital role to play in solving today’s most challenging energy and environmental problems, and the outlook for materials science engineers is incredibly promising. Engineering as a whole remains one of the highest-paying industries for college graduates, and the job sector of materials science engineers is expected to see substantial growth in the coming decades. Developments in the field of nanotechnology and in the use of biomedical materials, high-performance textiles, composites and sustainable materials, are also creating more job opportunities.

With a materials science and engineering degree from the University of Delaware, you will be poised for success in industries that impact societal needs in energy, the environment, and biomedicine as well as other consumer needs such as semiconductor and electronics manufacturing.

CAREER PATHS:

- Aerospace
- Armed forces and defense
- Automotive industry
- Biotech/Biomedical Devices
- Manufacturing
- Micro/Nanoelectronics
- Nuclear industry
- Oil and gas
- Pharmaceuticals
- Renewable Energy
- and more!**

GRADUATE SCHOOL FOR:

- Composites
- Biotechnology/Biomaterials
- Nanotechnology
- Electronic and Optical Material
- Energy Production/Storage
- Environmentally Sustainable Materials
- Polymers and Soft Matter
- Medicine
- Law
- MBA
- and more!**

MSEG.UDEL.EDU



MSEG @ UD

The Materials Science and Engineering (MSEG) Department at the University of Delaware is a world leader in research and education related to the design, synthesis, processing, and characterization of solid organic, inorganic, and hybrid materials. Faculty and students in MSEG are involved in a wide array of projects focusing on biomaterials, photovoltaics, polymers, semiconductors, and nanocomposites. Strong collaborations and interactions with established areas of excellence on campus include the Center for Composite Materials, the Institute for Energy Conversion, and the Delaware Biotechnology Institute.

Materials Science and Engineering Curriculum:

To earn a bachelor's degree, students must complete 126 credits and meet specific requirements as outlined in the online catalog.

FIRST YEAR

| FALL | Credits | SPRING | Credits |
|---|---------|---|---------|
| EGGG 101 - Introduction to Engineering (FYE) | 2 | MSEG 111 - Freshman Materials Experience | 2 |
| CHEM 111 - General Chemistry | 3 | CHEM 112 - General Chemistry | 3 |
| MATH 241 - Analytic Geometry & Calculus A | 4 | MATH 242 - Analytic Geometry & Calculus B | 4 |
| CISC 106 - General Computer Science for Engineers | 3 | PHYS 207 - Fundamentals of Physics I | 4 |
| ENGL 110 - Seminar in Composition | 3 | Breadth Requirement Elective 1 | 3 |
| Total Credits: 15 | | Total Credits: 16 | |

SECOND YEAR

| FALL | Credits | SPRING | Credits |
|--|---------|---|---------|
| MSEG 201 - Introduction to Materials Science | 3 | MSEG 211 - Thermodynamics & Statistical Mechanics | 3 |
| MATH 243 - Analytic Geometry & Calculus C | 4 | MSEG 212 - Materials Chemistry & Kinetics | 3 |
| PHYS 208 - Fundamentals of Physics II | 4 | MATH 351 - Engineering Mathematics I | 3 |
| COMM 212 - Oral Communication in Business | 3 | Technical Elective 1 | 3 |
| Breadth Requirement Elective 2 | 3 | Breadth Requirement Elective 3 | 3 |
| Total Credits: 17 | | Total Credits: 15 | |

THIRD YEAR

| FALL | Credits | SPRING | Credits |
|--|---------|--|---------|
| MSEG 305 - Materials Science & Engineering Lab I | 4 | MSEG 312 - Solid State Physics & Quantum Mechanics | 3 |
| MSEG 303 - Introduction to Polymers | 3 | MSEG 311 - Structural & Mechanical Properties of Materials | 3 |
| MSEG 304 - Computational Materials Science & Engineering | 3 | MSEG 315 - Materials Science & Engineering Lab II | 4 |
| Technical Elective 2 | 3 | Technical Elective 3 | 3 |
| Breadth Requirement Elective 4 | 3 | Breadth Requirement Elective 5 | 3 |
| Total Credits: 16 | | Total Credits: 16 | |

FOURTH YEAR

| FALL | Credits | SPRING | Credits |
|---|---------|---|---------|
| MSEG 401 - Design of Materials & Their Application (DLE & Capstone) | 6 | MSEG 415 - Degradation & Failure of Materials | 3 |
| MSEG 402 - Nanoscale Materials Laboratory | 4 | MSEG Elective | 3 |
| MSEG Elective | 3 | MSEG Elective | 3 |
| Breadth Requirement Elective 6 | 3 | Technical Elective 4 | 3 |
| Total Credits: 16 | | Technical Elective 5 | 3 |
| | | Total Credits: 15 | |

CONTACT US:

Department of Materials Science and Engineering
201 Du Pont Hall
Newark, DE 19716
Phone: 302-831-2062
Email: mseg-info@udel.edu
Web: mseg.udel.edu