MATERIALS SCIENCE

UW-EAU CLAIRE UNDERGRADUATE FACT SHEET

The field of materials science and engineering is the study of condensed matter (solids and liquids), and how that understanding can be applied to fabricating devices and structures of utility. A relatively young discipline, materials science is an outgrowth of two traditional areas: the study of matter and its structure-property relationship that originated in chemistry and physics, and developments in various materials engineering fields such as microelectronics, metallurgy and plastics.

This major is designed to give students a strong foundation in fundamental sciences and mathematics. The absence of engineering courses in a materials science major is unusual, as is integrating the major into a liberal arts and sciences degree. The structure of the major is deliberately interdisciplinary and broadly defined. Students with this major specialize by choosing an emphasis. The major serves students who plan to enter the workforce after graduation, as well as students who want to pursue graduate education in areas such as materials science, engineering, chemistry and physics.

WHY STUDY MATERIALS SCIENCE?

Every day we come into contact with hundreds of manufactured objects that are essential to modern life: the vehicles we travel in; the clothes we wear; the machines in our homes and offices; the sport and leisure equipment we use; the computers and phones we can't live without; and the medical technology that keeps us alive. Everything we see and use is made from materials derived from the earth: metals, polymers, ceramics, semiconductors and composites. To develop the new products and technologies that will make our lives safer, more convenient, more enjoyable and more sustainable, we must understand how to make best use of the materials we already have and how to develop new materials that will meet the demands of the future. Materials science involves the study of the structure, properties and behavior of all materials, the development of processes to manufacture useful products from them, and research into environmentally friendly materials. The technological advances that have transformed our world during the last 20 years have been founded on developments in materials science and the related area of materials engineering. Materials are evolving faster today than at any time in history; enabling scientists and engineers to improve the performance of existing products and to develop innovative technologies that will enhance every aspect of our lives. Materials science has become a key discipline in the competitive global economy and is recognized as one of the technical disciplines with the most exciting career opportunities.

UW-EAU CLAIRE FACTS AT A GLANCE

- Location: Eau Claire, Wis.; city pop. 64,000, metro. pop. 151,000
- Average enrollment: 10,500
- Undergraduates: 10,063
- Graduate students: 503
- International students: 124
- Multicultural students: 485
- Average men-women ratio: 2-to-3
- Students who spend at least a semester studying abroad: 24%
- Students doing undergraduate research with faculty/staff: 710+
- ACT composite average: 24+
- Average high school rank: 77%
- Average class size: 28
- Faculty-student ratio: 1-to-20
- Computers-student ratio: 1-to-9
- Student organizations: 224
- Walk across campus: About 10 minutes
- Nickname: Blugolds
- Colors: Navy and old gold

THE EAU CLAIRE ADVANTAGE

- Small classes, individual attention.
- Opportunities to work one-on-one with faculty in materials science research.
- Opportunities to use excellent on-campus state-of-the-art materials science facilities including instrumentation housed in the Materials Science Center (www.uwec.edu/matsci). Instrumentation includes: a transmission electron microscope, a scanning electron microscope, an x-ray photoelectron spectrometer, a scanning tunneling electron microscope, atomic force microscopes, a high resolution inductively coupled plasma mass spectrometer, x-ray diffractometer, x-ray fluorescence spectrometer and a molecular beam epitaxial growth chamber.
- Students have summer research opportunities at UW-Eau Claire and other locations across the United States.

CAREER OPTIONS

- Materials science engineer
- Technical journalism
- Forensic science
- Technical sales and marketing

- Research and development
- Design and manufacture
- Quality assurance
- Production management
- Design and manufacture
- Graduate school to receive a master's degree or Ph.D. in materials science, engineering, physics or chemistry

UNDERGRADUATE PROGRAMS

Major

- Materials science comprehensive major (requires no minor) with a choice of six emphases:
  - Nanoscience
  - Physics of materials
  - Chemistry of materials
  - Applied materials
  - Geomaterials
  - Biomaterials
  - Liberal arts

HIGH SCHOOL PREPARATION

- To study materials science students should have curiosity, imagination and personal satisfaction from solving problems. They also should enjoy mathematics and analysis of the physical world.
- Ideally, students interested in materials science should complete four years of high school college preparatory mathematics and at least three years of high school science, including chemistry and physics.
- All students who enroll at UW-Eau Claire are required to have a minimum of 17 college preparatory units including:
  - 4 years of English (at least 3 composition and literature)
  - 2 years of a single foreign language
  - 3 years of math (algebra, geometry, 1 advanced college preparatory math)
  - 3 years of natural science
  - 3 years of social science (1 must be world or American history)
  - 2 additional units in the areas already mentioned or other academic areas

FRESHMAN COURSE WORK

Sample First Year

FALL SEMESTER

COURSE#	TITLE	CREDITS
MSCI 100	Intro to Nanoscience and Materials Science	3
MATH 114	Calculus I	4
CHEM 115	Chemical Principles	6
Social Science/Humanities/Elective		3
OR		
MATH 112	Precalculus	4
Chem 103	General Chemistry I	5
English 110	Introduction to College Writing	5
Wellness or Physical Activity		1

SPRING SEMESTER

COURSE#	TITLE	CREDITS
Math 215	Calculus II	4
Phys 231	University Physics I	5
English 110	Introduction to College Writing	5
OR		
MSCI 100	Intro to Nanoscience and Materials Science	3
MATH 114	Calculus I	4
CHEM 104	General Chemistry II	5
Social Science/Humanities/Elective		3

FOR MORE INFORMATION

For more information about UW-Eau Claire's programs in materials science, contact:

MATERIALS SCIENCE PROGRAM
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Eau Claire, WI 54702-4004
715-836-3732
www.uwec.edu/msci

For more information about campus including costs, housing, admission requirements and tours:

ADMISSIONS
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