MATERIALS SCIENCE (MSCI)

MSCI 100 Introduction to Materials Science and Nanoscience (4 crs)
Prerequisite: High school chemistry and high school physics.
Students explore how atomic bonds and molecular structure explain the properties of materials, and why nanomaterials have different properties.

Attributes: GE IIF Natural Science-Interdisciplinary Studies, Lab Science
Lecture/Discussion Hours: 3
Lab/Studio Hours: 3

MSCI 291 Special Topics in Materials Science (1-3 crs)
Prerequisite: CHEM 104 or CHEM 115; PHYS 232; MSE 221
Consent: Instructor Consent Required
Field trips optional. A total of no more than nine credits from MSCI 291 and MSCI 491 may be applied toward major or graduation.
Lecture and possibly laboratory or field work in the study of current topics in Materials Science of special interest to students and faculty.
Repeat: Course may be repeated for a maximum of 9 credits

MSCI 310 Nanotechnology in Today's World (3 crs)
No credit toward the Materials Science or Materials Science & Engineering comprehensive majors.
Provides the fundamentals of nanoscience at an elementary level, i.e., how material behavior, properties, and function change due to small size. Addresses applications in science and industry and nanotechnology products, along with environmental, social, and ethical implications.

Attributes: GE IIF Natural Science-Interdisciplinary Studies
Lecture/Discussion Hours: 3
Lab/Studio Hours: 0

MSCI 382 Advanced Materials Science and Nanoscience (3 crs)
Prerequisite: MSCI 234 or MSE 334; MSCI 300 or CHEM 433 or PHYS 445 (or equivalent).
A survey of materials science, including in-depth discussions of metals, ceramics, polymers, and semiconductors. Contrasting views of the "molecular" nature of matter and the "band" nature will be discussed. Includes in-depth discussion of Nanoscience and Materials Science.
Grading Basis: A-F Grades Only
Lecture/Discussion Hours: 3
Lab/Studio Hours: 0

MSCI 384 Materials Science Junior Seminar I (0.5 crs)
Prerequisite: Minimum junior standing
Career preparation for Materials Science majors. Will include seminars with external speakers and class discussions of relevant issues.
Lab/Studio Hours: 0
Seminar Hours: .5

MSCI 385 Materials Science Junior Seminar II (0.5 crs)
Prerequisite: MSCI 384
The second course in the junior seminar course sequence. Will include seminars with external speakers and class discussions of relevant issues.
Lab/Studio Hours: 0
Seminar Hours: .5

MSCI 391 Materials Science Seminar (1 cr)
Prerequisite: MSCI 234 and MSCI 355.
Students will explore career pathways in Materials Science. The course will offer a mix of seminars by various speakers and discussions about issues relevant to Materials Science.
Grading Basis: A-F Grades Only
Lab/Studio Hours: 0
Seminar Hours: 1

MSCI 395 Directed Studies (1-3 crs)
Prerequisite: Minimum 2.0 GPA in Materials Science or Materials Science & Engineering comprehensive majors
Consent: Department Consent Required
This course is designed to allow a single student or a group of students to pursue their educational goals and interests under the direction of a faculty member.
Repeat: Course may be repeated
Grading Basis: A-F Grades Only

MSCI 399 Independent Study - Juniors (1-3 crs)
Prerequisite: Minimum junior standing.
Consent: Department Consent Required
This course provides junior-level students with research opportunities in Materials Science or Materials Science & Engineering.
Repeat: Course may be repeated
Grading Basis: A-F Grades Only

MSCI 480 Advanced Materials Science Lab I (1 cr)
Prerequisite: MSCI 362, MSCI 363, MSCI 382, PHYS 338.
First of a two-course capstone sequence. Focuses on hands-on, project-based, research-inspired labs that emphasize diverse areas of Materials Science.
Grading Basis: A-F Grades Only
Lecture/Discussion Hours: 0
Lab/Studio Hours: 3

MSCI 481 Advanced Materials Science Lab II - Scientific Writing (1 cr)
Prerequisite: MSCI 480, or consent of instructor.
Consent: Instructor Consent Required
Second of a two-course capstone sequence. Focuses on preparation of a scientific paper, including a Materials Science literature review and developing a manuscript for publication. Students will use experimental processes and results obtained from MSCI 480 in developing the manuscript.
Grading Basis: A-F Grades Only
Lecture/Discussion Hours: 0
Lab/Studio Hours: 3
**MSCI 484 Materials Science Capstone I (1 cr)**
Prerequisite: MSE 350; Credit may not be earned in both MSCI 480 and MSCI 484
First of a two-course capstone sequence. This course emphasizes hands-on, project-based experiences that are formulated and executed by the student.

Lab/Studio Hours: 0
Seminar Hours: 2

**MSCI 485 Materials Science Capstone II (2 crs)**
Prerequisite: MSCI 484; Credit may not be earned in both MSCI 485 and MSCI 481
Second of a two-semester capstone sequence. This course emphasizes writing projects based on student designed experiments.

Attributes: LE-I1 Integration
Lab/Studio Hours: 0
Seminar Hours: 4

**MSCI 491 Special Topics in Advanced Materials Science (1-3 crs)**
Prerequisite: MSCI 300. Limited to Materials Science or Materials Science & Engineering majors.
Consent: Instructor Consent Required
• Field trips optional. A total of no more than nine credits from MSCI 291 and MSCI 491 may be applied toward major or graduation.

Lecture and possibly laboratory or field work in the study of current topics of Materials Science of special interest to advanced students and faculty.

Repeat: Course may be repeated for a maximum of 9 credits

**MSCI 499 Independent Study - Seniors (1-3 crs)**
Prerequisite: Minimum senior standing.
Consent: Department Consent Required
This course provides senior-level students with research opportunities in Materials Science or Materials Science & Engineering.

Repeat: Course may be repeated
Grading Basis: A-F Grades Only