

TO: College of Arts and Sciences Curriculum Committee

FROM: Marc McEllistrem, Program Director
Materials Science and Engineering

DATE: 9/20/18

RE: Program Change – MATERIALS SCIENCE MEMO #2

We request implementation of the following program change with the next possible *Catalog*.

Create a single comprehensive major: Materials Science, Comprehensive Major, Liberal Arts (Code 250-XXX) in place of the Materials Sciences emphases being eliminated.

The creation of the single comprehensive major was approved by Materials Science on August 23, 2018. Details of the new major are attached.

Changes proposed, compared to the previously approved majors in Materials Science (various emphases) - Core Courses (see the attached document) are the same, including those in Chemistry, Physics, and Math. The list of Elective Courses in Materials Science and Engineering has been updated (to include recently developed MSE courses), and the description of the Emphasis Courses has been revised to encompass all of the Emphases in the prior program codes. We note that the distribution of credits between Elective Courses and Emphasis Courses has changed (from 4 cr. Electives, 8 cr. Emphasis) to 6 cr. for each.

Justification: The faculty in Materials Science and Engineering have been asked by Academic Affairs to consolidate all of the Materials Science emphases into a single major program with one code as part of the "Program Array" plan.

Attachment

Requirements for Materials Science Comprehensive Major, Liberal Arts (Code 250-XXX)

Materials Science Core

The structure of the major is unique: it integrates an engineering-oriented field into a liberal arts and sciences degree, and is thus deliberately interdisciplinary and broadly defined, consistent with a liberal education approach. Students specialize through a chosen emphasis. The major serves students who plan to enter the workforce after graduation as well as students interested in graduate education in areas such as Materials Science, Engineering, Chemistry, and Physics.

The degree is comprised of a minimum of 62 credits, including completion of core courses, at least six credits from courses in the Materials Science electives, and at least six credits in a chosen emphasis. Credits applied toward the electives and emphasis must be unique credits.

CORE COURSES

Materials Science

MSE 221	Living in a Materials World	3
MSE 315	Materials Characterization	4
MSE 334	Soft Materials	4
MSE 350	Thermodynamics of Materials	4
MSE 357	Phase Transformation & Kinetics	3
MSCI 384	Materials Science Junior Seminar I	0.5
MSCI 385	Materials Science Junior Seminar II	0.5
MSCI 484	Materials Science Capstone I	1
MSCI 485	Materials Science Capstone II	2

Chemistry

CHEM 115	Chemical Principles	6
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or

CHEM 103 & CHEM 104	General Chemistry I and General Chemistry II ¹	
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or

CHEM 105 & CHEM 106 & CHEM 109	General Chemistry I Lecture and General Chemistry I Laboratory and General Chemistry II with Lab ¹	
CHEM 325	Organic Chemistry I with Laboratory	4

Mathematics

MATH 114	Calculus I	4
MATH 215	Calculus II	4

Physics

PHYS 231	University Physics I	5
PHYS 232	University Physics II	5

<u>MSE 256</u>	Introduction to Computer Aided Design
<u>MSE 362</u>	Microelectronic Materials Processing
<u>MSE 363</u>	Microelectronic Materials Processing Lab
<u>MSE 367</u>	Macroprocessing of Materials
<u>MSE 368</u>	Macroprocessing Materials Lab
<u>MSE 372</u>	Transport Phenomena
<u>MSE 374</u>	Physics of Solids
<u>MSE 451</u>	Computational Materials Science
<u>MSE 475</u>	Nanomaterials
<u>MSE 493</u>	Collaborative Internship
<u>MSE 494</u>	Off-Campus Materials Science Internship
<u>MSCI 395</u>	Directed Studies
<u>MSCI 399</u>	Independent Study - Juniors
<u>MSCI 499</u>	Independent Study - Seniors

¹ Only six credits apply to major.

NOTES:

1. A maximum of 3 credits total from [MSCI 395](#), [MSCI 399](#), and [MSCI 499](#) and [MSE 493](#) and [MSE 494](#) may be applied toward the electives category.
2. [MATH 312](#) is recommended for students planning to attend graduate school.

Emphasis Requirements

Core courses plus six credits from the Elective courses plus six credits in an Emphasis. All six emphasis credits must meet the requirements described in either A or B below:

A. Defined emphasis

- Be from the same prefix
- Be from the following prefixes: BIOL, CHEM, CS, GEOL, MATH, MGMT, PHYS
- Be from UWEC courses numbered 300 or above, or from courses appropriate for a major, such as: BIOL 221, 222, 223; CHEM 213, 218; CS 145, 148, 163, 170, 245, 252; GEOL 106, 110, 115, 118; and Math 216

B. Distributed emphasis

The student may pursue an emphasis that reflects a thematic area of concentration and intentional connections. Such an emphasis, with approval of the faculty advisor, must draw from courses appropriate for a major in another area distinct from Materials Science and Engineering.