MATERIALS SCIENCE, APPLIED MATERIALS EMPHASIS, COMPREHENSIVE MAJOR

University Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Liberal Arts (Code 250-006)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>GRADUATION REQUIREMENTS FOR BACCALAUREATE DEGREE</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Credit Requirements</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Minimum total for graduation</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td>Upper division credits (courses numbered 300 and higher)</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>Liberal Education Core</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>Academic Concentrations</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Grade Point Requirements</strong></td>
<td>2.00 average</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>2.00 average</td>
</tr>
<tr>
<td></td>
<td>Resident</td>
<td>2.00 average</td>
</tr>
<tr>
<td></td>
<td>Major</td>
<td>2.00 average</td>
</tr>
<tr>
<td></td>
<td>Minor</td>
<td>2.00 average</td>
</tr>
<tr>
<td></td>
<td>Certificate</td>
<td>2.00 average</td>
</tr>
<tr>
<td></td>
<td><strong>University Residency Requirements</strong></td>
<td>25 percent of credits</td>
</tr>
<tr>
<td></td>
<td>Minimum total</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Senior year</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Major, Standard, upper division in residence</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Major, Comprehensive, upper division in residence</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Certificate</td>
<td>One (1) learning experience</td>
</tr>
<tr>
<td></td>
<td><strong>Procedures Required for Graduation</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Obtain admission to the degree program and/or the College offering it.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Apply for graduation on CampS.</td>
<td></td>
</tr>
</tbody>
</table>

Liberal Education Core

The University of Wisconsin-Eau Claire measures learning outcomes to ensure that its graduates have achieved a liberal education and prepared themselves to contribute to a complex society. Upon graduation, each undergraduate will have met the four learning goals of our liberal education core and the 11 learning outcomes they comprise.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>LIBERAL EDUCATION CORE REQUIREMENTS</strong></td>
<td>a minimum of 36 credits</td>
</tr>
</tbody>
</table>

Knowledge Goal

- Knowledge Outcome 1 (K1): Natural Sciences
  - Two (2) learning experiences
  - One experience in laboratory science must be selected from either K1 or K2.
- Knowledge Outcome 2 (K2): Social Sciences
  - Two (2) learning experiences
  - One experience in laboratory science must be selected from either K1 or K2.
- Knowledge Outcome 3 (K3): Humanities
  - Two (2) learning experiences
- Knowledge Outcome 4 (K4): Fine Arts
  - One (1) learning experience

Skills Goal

- Skills Outcome 1 (S1): Written and Oral Communication
  - Two (2) learning experiences
  - One S1 must meet the University Writing Requirement
- Skills Outcome 2 (S2): Mathematics
  - One (1) learning experience
  - One S2 to meet the University Mathematics Requirement
- Skills Outcome 3 (S3): Creativity
  - One (1) learning experience

Responsibility Goal

- Responsibility Outcome 1 (R1): Equity, Diversity, and Inclusivity
  - Two (2) learning experiences
  - One R1 must satisfy Design for Diversity
- Responsibility Outcome 2 (R2): Global Perspectives
  - One (1) learning experience
- Responsibility Outcome 3 (R3): Civic and Environmental Issues
  - One (1) learning experience

Integration Goal

- Integration Outcome 1 (I1): Integration
  - Two (2) learning experiences

Service-Learning Goal

- Service-Learning
  - 30 hours

College Degree Requirements

Bachelor of Arts or Bachelor of Science Degree (B.A./B.S.)

University Graduation Requirements. All candidates for degrees must fulfill the requirements for credits, curriculum, GPA, and University residency as specified in the section of this catalog titled University Graduation Requirements.

College Graduation Requirements: Grade Point Averages. All candidates for degrees in the College of Arts and Sciences must earn minimum resident and total GPAs of 2.00 in the major, the minor, and the certificate. The resident and
total GPAs for the major are computed using all attempted credits applicable to the major including those offered by departments other than the major department. The resident and total GPAs for the minor and the certificate are computed similarly.

**Major-Minor and Major-Certificate Requirements.** A standard major (a minimum of 36 credits) must be supplemented by a minor (a minimum of 24 credits) or by a certificate (12 to 18 credits) to meet graduation requirements for completing a first and second degree program. No minor or certificate is required with a Comprehensive Major (60 or more credits) or with two majors of 36 or more credits each.

Certain degree programs which include Comprehensive Majors may require more than the minimum of 120 credits for graduation.

Acceptable academic program combinations are determined at the college level. A major and a minor or a major and certificate or two majors (if available) may not be elected in the same department or program, except in the approved combinations listed here.

**College Credits.** Earn at least 90 credits in courses offered by the College of Arts and Sciences.

**Bachelor of Arts Degree in the College of Arts and Sciences (B.A.)**

Fulfillment of all University Graduation Requirements (which includes the Liberal Education Core); all College-level degree requirements (major and minor/certificate emphases, GPAs, earning at least 90 credits in Arts and Sciences course work); foreign language competency at the 102 level. Foreign language competency may be met in one of two ways: (1) Achieve a score on the foreign language placement test that qualifies the student to enter the 201-level course in a foreign language. (2) Earn a grade of at least C (not C-) or a mark of S in a 102-level foreign language course (or AIS 112 or AIS 122 / LANG 122 or CSD 103).

**Bachelor of Science Degree in the College of Arts and Sciences (B.S.)**

Fulfillment of all University Graduation Requirements (which includes the Liberal Education Core); all College-level degree requirements (major and minor/certificate emphases, GPAs, earning at least 90 credits in Arts and Sciences course work); mathematics competency at the MATH 111, MATH 112 or MATH 113 level. Mathematics competency can be met in one of three ways: (1) Achieve a score on the mathematics placement test that qualifies the student to enter MATH 114. (2) Earn a grade of at least C (not C-) or a mark of S in MATH 111, MATH 112, or MATH 113. (3) Achieve a satisfactory score on the MATH 112 competency test. This test may be attempted no more than two times.

**Major Requirements**

**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 four credits from courses in the Materials Science elective, and at least eight credits in a chosen emphasis. Credits applied toward the elective and emphasis must be unique credits.

**Code** | **Title** | **Credits**
---|---|---
**CORE COURSES**
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
CHEM 103 | General Chemistry I | 4
& CHEM 104 | General Chemistry II | 4
CHEM 105 | General Chemistry I Lecture | 4
& CHEM 106 | General Chemistry I Laboratory | 4
& CHEM 109 | General Chemistry II with Lab | 4
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
**Elective Courses**
MSE 362 | Microelectronic Materials Processing | 4
MSE 363 | Microelectronic Materials Processing Lab | 4
MSE 367 | Macroprocessing of Materials | 4
MSE 368 | Macroprocessing Materials Lab | 4
MSE 372 | Transport Phenomena | 4
MSE 451 | Computational Materials Science | 4
MSE 475 | Nanomaterials | 4
MSCI 395 | Directed Studies | 4
MSCI 399 | Independent Study - Juniors | 2
MSCI 499 | Independent Study - Seniors | 2

1 Only six credits apply to major.

**NOTES:**

1. Up to two credits total from MSCI 395, MSCI 399, and MSCI 499 may be applied toward any emphasis upon approval of a faculty advisor.

2. MATH 312 is recommended for students planning to attend graduate school.
## Applied Materials Emphasis

Core and elective courses plus eight credits from the following courses, at least two of which must have the same prefix:

<table>
<thead>
<tr>
<th>Course Code</th>
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</tr>
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<tbody>
<tr>
<td>MATH 312</td>
<td>Differential Equations and Linear Algebra</td>
</tr>
<tr>
<td>MATH 345</td>
<td>Introduction to Probability and Mathematical Statistics</td>
</tr>
<tr>
<td>MATH 443</td>
<td>Experimental Design and Analysis</td>
</tr>
<tr>
<td>PHYS 255</td>
<td>Statics</td>
</tr>
<tr>
<td>PHYS 340</td>
<td>Optics</td>
</tr>
<tr>
<td>PHYS 350</td>
<td>Electric and Electronic Circuits</td>
</tr>
<tr>
<td>PHYS 356</td>
<td>Dynamics</td>
</tr>
<tr>
<td>PHYS 360</td>
<td>Electronics</td>
</tr>
<tr>
<td>PHYS 361</td>
<td>LabVIEW Basics</td>
</tr>
<tr>
<td>PHYS 362</td>
<td>LabVIEW Applications</td>
</tr>
<tr>
<td>CHEM 213</td>
<td>Quantitative Analysis</td>
</tr>
<tr>
<td>CHEM 274</td>
<td>Chemical Industry Seminar</td>
</tr>
<tr>
<td>MSE 362</td>
<td>Microelectronic Materials Processing</td>
</tr>
<tr>
<td>MSE 363</td>
<td>Microelectronic Materials Processing Lab</td>
</tr>
<tr>
<td>MSE 367</td>
<td>Macroprocessing of Materials</td>
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