

## MATERIALS SCIENCE AND ENGINEERING AREA OF CONCENTRATION, ENGINEERING SCIENCE AS: 413

Total Credits: 60

Catalog Edition: 2021-2022

### Program Description

**THIS PROGRAM IS SUSPENDED EFFECTIVE FALL 2020. STUDENTS MAY NOT ENROLL IN SUSPENDED PROGRAMS. STUDENTS ENROLLED IN THIS PROGRAM PRIOR TO FALL 2020 WILL NOT BE ABLE TO GRADUATE WITH THIS DEGREE AFTER SPRING 2023. PLEASE REFER TO THE MECHANICAL ENGINEERING AREA OF CONCENTRATION, ENGINEERING SCIENCE AS: 404 OR GENERAL ENGINEERING AREA OF CONCENTRATION, ENGINEERING SCIENCE AS: 410.**

This curriculum is designed to provide the first two years of a four-year program leading to the award of a BS in engineering. A student planning to transfer to any baccalaureate degree granting institution should follow the appropriate area of concentration listed below in consultation with an engineering advisor. The student should also visit the Montgomery College Engineering Advising website [www.montgomerycollege.edu/engineeringadvising](https://www.montgomerycollege.edu/engineeringadvising) for up-to-date comprehensive information on transfer requirements for all universities and colleges with which we have an articulated transfer program.

Completion of all requirements for any area of concentration in engineering science will lead to the award of the AS in engineering science.

This area of concentration will prepare students to transfer to a four-year university with a major in materials science and engineering. Specific requirements in colleges vary, and the student preparing for a particular institution may, with approval, change the sequence listed below; this sequence of courses is articulated with the materials science and engineering program at the University of Maryland, College Park. A suggested course sequence for full-time students follows; all students should consult an engineering advisor. The student should also visit the Montgomery College Engineering Advising website at

[www.montgomerycollege.edu/engineeringadvising](https://www.montgomerycollege.edu/engineeringadvising) for up-to-date comprehensive information.

### Program Outcomes

Upon completion of this program a student will be able to:

- Identify, formulate, and solve basic physics and engineering problems in material science.
- Identify properties of various materials and their applications.
- Use appropriate computer application software in material engineering.

### Program Advisors

- **Email:** [engineeringprogram@montgomerycollege.edu](mailto:engineeringprogram@montgomerycollege.edu)
- **Phone:** 240-567-5230

For more information, please visit <https://www.montgomerycollege.edu/engineering-advising>

To view the Advising Worksheet, please visit <https://www.montgomerycollege.edu/documents/counseling-and-advising/advising-worksheets/current-catalog/413.pdf>

2021-2022

# Program Advising Guide

An Academic Reference Tool for Students

# MATERIALS SCIENCE AND ENGINEERING AREA OF CONCENTRATION, ENGINEERING SCIENCE AS: 413

## Suggested Course Sequence

A suggested course sequence for full-time students follows. All students should review this advising guide and consult an advisor.

### First Semester

ENGL 102 - Critical Reading, Writing, and Research 3 semester hours (ENGF)

MATH 181 - Calculus I 4 semester hours (MATF)

CHEM 135 - General Chemistry for Engineers 4 semester hours

OR

CHEM 132 - Principles of Chemistry II 4 semester hours

ENES 100 - Introduction to Engineering Design 3 semester hours (NSND/GEEL)

### Third Semester

CHEM 203 - Organic Chemistry I 5 semester hours

MATH 280 - Multivariable Calculus 4 semester hours

PHYS 262 - General Physics II: Electricity and Magnetism 4 semester hours (NSLD)

Behavioral and Social Science 3 semester hours (BSSD) \*\*

### Second Semester

ENES 102 - Statics 3 semester hours

MATH 182 - Calculus II 4 semester hours

PHYS 161 - General Physics I: Mechanics and Heat 3 semester hours (NSND)

Behavioral and Social Sciences Distribution 3 semester hours (BSSD) \*\*

Humanities Distribution 3 semester hours (HUMD)

### Fourth Semester

ENES 206 - MATLAB for Engineers 1 semester hour

ENES 220 - Mechanics of Materials 3 semester hours

MATH 282 - Differential Equations 3 semester hours

PHYS 263 - General Physics III: Waves, Optics, and Modern Physics 4 semester hours

Arts Distribution 3 semester hours (ARTD)

## Total Credit Hours: 60

\*\* Behavioral and Social Science Distribution (BSSD) courses must come from different disciplines.

## Advising Notes

Most engineering students will start at MC missing one or more pre-requisites for CHEM 131, CHEM 132, CHEM 135, ENGL 102, ENES 100, and MATH 181.

The appropriate initial chemistry courses will be determined by the student's score on the Chemistry Placement Exam, mathematics level, AP/IB credits, or transfer credits. Possible courses include CHEM 099, CHEM 131, CHEM 132, or CHEM 135. Either CHEM 132 or CHEM 135 satisfies the required chemistry credit for UMCP. CHEM 131-CHEM 132 satisfies the required chemistry credit for UMBC, but CHEM 135 does not.

The pre-requisite for ENGL 102 is ENGL 101 or ENGL 101A. English course placement is determined by the Accuplacer English/Reading Test.

The co-requisite for ENES 100 is MATH 165 or higher.

The pre-requisite for MATH 181 is MATH 165 (Precalculus). Mathematics initial course placement will be determined by the ALEKS Math Placement, Accuplacer Math Test, AP/IB credit, or transfer credits.

UMCP's ENMA 300 and ENMA 301, for which MC has no equivalents, must be completed after transfer or through MTAP.

## Transfer Opportunities

Montgomery College has partnerships with multiple four-year institutions and the tools to help you transfer. To learn more, please visit <https://www.montgomerycollege.edu/transfer> or <http://artsys.usmd.edu>.

## Get Involved at MC!

Employers and Transfer Institutions are looking for experience outside the classroom.

MC Student Clubs and Organizations: <https://www.montgomerycollege.edu/life-at-mc/student-life/>

Engineering Student Professional Groups: <https://www.montgomerycollege.edu/academics/programs/engineering-science/resources.html>

## Related Careers

Some require a Bachelor's degree.

Security Management Specialist, Compliance Manager, Architectural and Engineering Manager, Municipal Firefighter, Fire-Prevention and Protection Engineer.

## Career Services

Montgomery College offers a range of services to students and alumni to support the career planning process. To learn more, please visit <https://www.montgomerycollege.edu/career>

## Career Coach

A valuable online search tool that will give you the opportunity to explore hundreds of potential careers or job possibilities in Maryland and the Washington D.C. metropolitan area. Get started today on your road to a new future and give it a try. For more information, please visit <https://montgomerycollege.emsicc.com>

## Notes: