

## MATERIALS SCIENCE ENGINEERING, ENGINEERING SCIENCE ASSOCIATE OF SCIENCE: 413

Total Credits: 64

Catalog Editions: 2012-13 through 2015-16

### Program Description

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 track listed below in consultation with an engineering advisor. The student should also visit the Montgomery College Engineering Advising website [www.montgomerycollege.edu/engineeringadvising](http://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 track in engineering science will lead to the award of the AS in engineering science.

This track will prepare students to transfer to a four-year university with a major in electrical 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 electrical engineering program at the University of Maryland, College Park. A suggested course sequence for full-time students follows; all students should consult an engineering adviser. The student should also visit the Montgomery College Engineering Advising website at [www.montgomerycollege.edu/engineeringadvising](http://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 mechanics and nuclear physics.
- Identify properties of various materials and their applications.
- Use appropriate computer application software in material engineering.

### Program Advising

#### Rockville

- **Dr. Uche Abanulo, 240-567-4120**  
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- **Dr. Donald Day, 240-567-5235**  
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- **Dr. Alex Hou, 240-567-7608**  
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#### Germantown

- **Dr. Charles Kung, 240-567-7799**  
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- **Prof. Monica Malini, 240-567-1827**  
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#### Takoma Park/Silver Spring

- **Dr. Max Nam, 240-567-1433**  
[Max.Nam@montgomerycollege.edu](mailto:Max.Nam@montgomerycollege.edu)
- **Dr. Hailu Gebremariam, 240-567-1432**  
[Hailu.Bantu@montgomerycollege.edu](mailto:Hailu.Bantu@montgomerycollege.edu)

For more information please visit:

[www.montgomerycollege.edu/engineeringadvising](http://www.montgomerycollege.edu/engineeringadvising)

2015-2016

# Program Advising Guide

An Academic Reference Tool for Students

# MATERIALS SCIENCE, ENGINEERING SCIENCE ASSOCIATE OF SCIENCE: 413

## Suggested Course Sequence

A suggested course sequence for full-time students follows. All students should review this advising sheet and consult an advisor. Visit [www.montgomerycollege.edu/engineeringadvising](http://www.montgomerycollege.edu/engineeringadvising) for more information.

### First Semester

CHEM 135 - General Chemistry for Engineers

4 semester hours (NSLD)

OR

CHEM 132 - Principles of Chemistry II

4 semester hours

ENGL 102 - Critical Reading, Writing, and Research

3 semester hours (ENGF)

ENES 100 - Introduction to Engineering Design

3 semester hours

MATH 181 - Calculus I

4 semester hours (MATF)

Health foundation

1 semester hour (HLTF)

### 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)

### Third Semester

MATH 280 - Multivariable Calculus

4 semester hours

PHYS 262 - General Physics II:

Electricity and Magnetism

4 semester hours (NSLD)

CHEM 203 - Organic Chemistry I

5 semester hours

Behavioral and social sciences distribution

3 semester hours (BSSD) \*\*

### Fourth Semester

ENEE 207 - Electric Circuits

4 semester hours

ENES 220 - Mechanics of Materials

3 semester hours

Arts distribution

3 semester hours (ARTD)

MATH 282 - Differential Equations

3 semester hours

PHYS 263 - General Physics III:

Waves, Optics, and Modern Physics

4 semester hours (NSLD)

### Total Credit Hours: 64

\*\* 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 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.

# MATERIALS AND SCIENCE ENGINEERING A.S.: 413

Total Credits: 64  
Catalog Editions 12-13 through 15-16

Name:  Date:  ID #:

| <b>GENERAL EDUCATION: FOUNDATION COURSES</b>        | <b>Course</b>           | <b>Hours</b> | <b>Grade</b> |
|---|-------------------------|--------------|--------------|
| English Foundation                                  | EN 102/ <b>ENGL 102</b> | 3            |              |
| Math Foundation                                     | MA 181/ <b>MATH 181</b> | 4            |              |
| Health Foundation HLHF (Choose HLTH 100 - HLTH 230) |                         |              |              |

| <b>GENERAL EDUCATION: DISTRIBUTION COURSES</b>   | <b>Course</b>           | <b>Hours</b> | <b>Grade</b> |
|--|-------------------------|--------------|--------------|
| Arts Distribution (ARTD)   |                         |              |              |
| Humanities Distribution (HUMD)   |                         |              |              |
| Behavioral & Social Sciences Distribution (BSSD) **  |                         | 3            |              |
| Behavioral & Social Sciences Distribution (BSSD) **  |                         | 3            |              |
| Natural Sciences Distribution with Lab (NSLD)  | PH 262/ <b>PHYS 262</b> | 4            |              |
| Natural Sciences Distribution without Lab (NSND) or<br>Natural Sciences Distribution with Lab (NSLD) | PH 161/ <b>PHYS 161</b> | 3            |              |

| <b>PROGRAM REQUIREMENTS</b>          | <b>Course</b>           | <b>Hours</b> | <b>Grade</b> |
|--------------------------------------|-------------------------|--------------|--------------|
| (only if needed for EN 102/ENGL102)  | EN 101/ <b>ENGL 101</b> | (3)          |              |
| (only if needed for MA 181/MATH 181) | MA 180/ <b>MATH 165</b> | (4)          |              |
|                                      | CH 135/ <b>CHEM 135</b> | 4            |              |
|                                      | CH 203/ <b>CHEM 203</b> | 5            |              |
|                                      | PH 263/ <b>PHYS 263</b> | 4            |              |
|                                      | ES 100/ <b>ENES 100</b> | 3            |              |
|                                      | ES 102/ <b>ENES 102</b> | 3            |              |
|                                      | ES 220/ <b>ENES 220</b> | 3            |              |
|                                      | EE 207/ <b>ENEE 207</b> | 4            |              |
|                                      | MA 182/ <b>MATH 182</b> | 4            |              |
|                                      | MA 280/ <b>MATH 280</b> | 4            |              |
|                                      | MA 282/ <b>MATH 282</b> | 3            |              |

Has student completed the  
Global Perspectives requirement?  Yes  No

Global Perspectives Course:

Overall GPA of 2.0 is required to graduate

Total Credits:

[Engineering and Computer Science Advising Web Page](#)

\*\* The two behavioral and social sciences courses MUST be in different disciplines

Last Modified: September 2015

Advising Worksheet Contact: [Anthony Solano](#)

See an [advisor](#) to submit an [Application for Graduation](#) the semester BEFORE you intend to graduate.

This UNOFFICIAL document is for planning purposes ONLY and completion does not guarantee graduation.

## Transfer Opportunities

Montgomery College has partnerships with multiple four-year institutions and the tools to help you transfer. To learn more please visit: <http://cms.montgomerycollege.edu/EDU/Plain.aspx?id=62341> or [artsys.usmd.edu](http://artsys.usmd.edu)

## Get Involved at MC!

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

### Engineering Student Professional Groups

<https://cms.montgomerycollege.edu/engorgs.aspx>

### MC Student Clubs and Organizations

<http://cms.montgomerycollege.edu/edu/plain.aspx?id=2439>

## 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

<http://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. Visit the website listed below:

<https://montgomerycollege.emsicareercoach.com>

## Advising Notes (continued)

- 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 Accuplacer Math Test, AP/IB credit, or transfer credits.
- UMCP's ENFP 250(3) and 255(3), for which MC has no equivalents, remain to be taken at UMCP after transfer.
- [ENES 240](#) (Engineering Computation) or [ENES 232](#) (thermodynamics) IS NOT required for transfer, but is transferable as equivalent to other technical elective courses in the junior year.

## Notes:



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