Engineering

Mission Statement
The mission of the FSU Engineering Program is to provide excellent undergraduate education in engineering; to establish close partnership with and provide technical knowledge to industry, government and local business; to contribute to economic development within the state of Maryland, specifically in the Western Maryland region; and to provide related services to the campus community and community at large.

Program Educational Objectives
Within the first few years following graduation, alumni of the Engineering BS program will demonstrate:

- Broad knowledge of mathematics, physical science and engineering science with emphasis in selected concentration areas of engineering to be successful in government, industry, private companies and interdisciplinary graduate programs
- Professional skills to function in multidisciplinary teams, use modern instruments, computers and engineering software to solve engineering problems, perform research and participate in design projects
- An understanding of professional responsibility to evaluate their ethical obligations to society, employers, employees and peers
- Motivation for lifelong learning to update their technical knowledge and understanding of societal and contemporary issues

Program Outcomes
Students will acquire the knowledge and skills needed to demonstrate the learning outcomes assessed throughout the curriculum. When students graduate, they will be able to:

a. Apply knowledge of mathematics, science and engineering
b. Design and conduct experiments, as well as analyze and interpret data
c. Design a system, component or process to meet desired needs
d. Function on multidisciplinary teams
e. Identify, formulate and solve engineering problems
f. Demonstrate an understanding of professional and ethical responsibility
g. Communicate effectively
h. Demonstrate the broad education necessary to understand the impact of engineering solutions in a global and societal context
i. Recognize the need for, and engage in, life-long learning
j. Demonstrate a knowledge of contemporary issues in engineering
k. Use the techniques, skills and modern engineering tools necessary for engineering practice

Summary of Requirements for Major in Engineering

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<tr>
<th>Major</th>
<th>ELECTRICAL</th>
<th>MATERIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 201 General Chemistry I (GEP Group C)</td>
<td>53-56</td>
<td>55-56</td>
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<tr>
<td>ENEE 114 Programming Concepts for Engineers</td>
<td>35</td>
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<tr>
<td>ENEE 408 Capstone Design Project</td>
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<tr>
<td>ENES 100 Introduction to Engineering Design</td>
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<td>ENES 401 Fundamentals of Energy Engineering</td>
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<td>ENES 491 Engineering Seminar</td>
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<td>ENME 350 Electronics and Instrumentation I</td>
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<tr>
<td>MATH 432 Differential Equations*</td>
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<tr>
<td>PHYS 261 Principles of Physics I – Mechanics (GEP Group C)*</td>
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<td>PHYS 262 Principles of Physics II – E&amp;M*</td>
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<td>PHYS 263 Principles of Physics III – Acoustics and Optics*</td>
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<tr>
<td>PHYS 264 Principles of Physics IV – Thermo. and Mod. Phys.*</td>
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*B.S. in Engineering at AACC and Cecil College

The B.S. in Engineering is also offered at the Anne Arundel Community College Regional Higher Education Center at Arundel Mills in collaboration with AACC (electrical engineering) and at Cecil College (materials engineering). Students with an associate degree in engineering may complete the bachelor’s degree through onsite, interactive video, and online courses offered at these sites. See pages 110-111.
2. Area of Concentration (32-35 hours)

Majors must choose to concentrate in one of the following areas:

**Electrical Engineering (32-35 hours)**

- ENEE 204 Basic Circuit Theory
- ENEE 206 Fund. Digital and Electric Circuits Lab
- ENEE 244 Digital Logic Design
- ENEE 303 Analog and Digital Electronics
- ENEE 307 Electronic Circuits Lab
- ENEE 350 Computer Organization
- ENEE 380 Electromagnetic Theory
- ENES 310 Mechatronic and Robotic Design
- ENEE 439 Topics in Signal Processing
- ENEE 475 Power Electronics

Two electives from any 300- or 400-level ENEE, ENES or ENME course or CHEM 304

**Materials Engineering (34 hours)**

- ENES 102 Statics
- ENES 220 Mechanics of Materials
- ENES 221 Dynamics
- ENME 232 Thermodynamics
- ENME 331 Fluid Mechanics
- ENME 332 Transfer Processes
- ENME 362 Engineering Materials and Manufacturing
- ENME 405 Fundamentals of Materials Engineering
- ENME 425 Microfabrication

Two electives from any 300- or 400-level ENEE, ENES, or ENME course or CHEM 304
Engineering

Engineering BS at AACC
Located at AACC at Arundel Mills, a Regional Higher Education Center

Total Hours Required at FSU: 50

Coordinator:
Wudyaew Wondmagegn, Assistant Professor

Onsite Coordinator:
Marjorie Rawhouser, Associate Professor

About the Program
- Accessible
- Earn your B.S. degree close to home
- Affordable
- FSU has one of the lowest tuition rates in the state of Maryland
- Transfer-friendly
- Credits taken at community college applied toward the B.S. degree
- FSU offers a Bachelor of Science in Engineering degree with an electrical engineering concentration at Anne Arundel Community College at Arundel Mills Regional Higher Education Center.
- This program is designed to meet the needs of modern industry and is open to community college graduates who have completed an A.S. or A.S.E. degree in Engineering.
- FSU offers courses on site and via distance learning for students at the Arundel Mills Center to complete the Bachelor of Science requirements.

Program Educational Objectives
Within the first few years following graduation, alumni of the Engineering BS program will:
1. Meet regional workforce needs in engineering
2. Integrate effective workforce skills, best practices and ethical principles
3. Work effectively in multidisciplinary teams and communicate ideas orally and in writing
4. Demonstrate motivation for lifelong learning for personal enrichment and to achieve professional success

Program Outcomes
Students will acquire the knowledge and skills needed to demonstrate the learning outcomes assessed throughout the curriculum. When students graduate, they will be able to:
- Apply knowledge of mathematics, science and engineering
- Design and conduct experiments, as well as analyze and interpret data
- Design a system, component or process to meet desired needs
- Function on multidisciplinary teams
- Identify, formulate and solve engineering problems
- Demonstrate an understanding of professional and ethical responsibility
- Communicate effectively
- Demonstrate the broad education necessary to understand the impact of engineering solutions in a global and societal context
- Recognize the need for, and engage in, lifelong learning
- Demonstrate knowledge of contemporary issues in engineering
- Use the techniques, skills and modern engineering tools necessary for engineering practice

Program Requirements
To earn the Bachelor of Science in Engineering from FSU, students must complete a total of 120 credit hours of coursework.

Students entering this program must have an associate’s degree in engineering from a community college and are expected to have completed:
1. 32-33 credits of general education, to include Freshman Composition, 3 credits in the arts, 6 credits in the humanities and 6 credits in social sciences
2. 3 additional credits (any category)
3. Calculus 1, 2 and 3 and Differential Equations
4. Calculus-based physics sequence
5. General Chemistry
6. Engineering coursework, to include Introduction to Engineering Design, Circuit Theory, Programming in C and Digital Logic Design

All majors must earn a C or better in the following prerequisite courses for the major requirements at FSU: MATH 236, MATH 237, MATH 238, MATH 432, PHYS 261, PHYS 262, PHYS 263 and PHYS 264.

Once admitted into the program at AACC at Arundel Mills, students will complete a minimum of 50 additional credits of engineering and upper-division general education coursework. The majority of the upper-division courses will be taught on site at AACC at Arundel Mills Regional Higher Education Center. Several will be delivered via interactive video or through online learning.

Courses at FSU (50 hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>IDIS 150</td>
<td>First-Year FSU Colloquium</td>
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<tr>
<td>ENE 303</td>
<td>Analog and Digital Electronics</td>
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<td>ENE 307</td>
<td>Electronic Circuits Lab</td>
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<td>ENES 491</td>
<td>Seminar</td>
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<tr>
<td>ENGL 338</td>
<td>Technical Writing</td>
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<tr>
<td>ENME 350</td>
<td>Electronics and Instrumentation I</td>
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<tr>
<td>ENME 351</td>
<td>Electronics and Instrumentation II</td>
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</tbody>
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Two electives from any 300- or 400-level ENEE, ENES or ENME course. Any courses offered at FSU to meet credit requirements.
Engineering

Engineering BS at Cecil College

Total Hours Required at FSU: 55

Coordinator:
Mahdi Norouzi,
Assistant Professor

About the Program
- Accessible
- Earn your B.S. degree close to home
- Affordable
- FSU has one of the lowest tuition rates in the state of Maryland
- Transfer-friendly
- Credits taken at community college applied toward the B.S. degree
- FSU offers a Bachelor of Science in Engineering degree with a materials engineering concentration at Cecil College's Northeast campus.
- This program is designed to meet the needs of modern industry and is open to community college graduates who have completed an A.S. or A.S.E. degree in Engineering.
- FSU offers courses on site and via distance learning for students at Cecil College to complete the Bachelor of Science requirements.

Program Educational Objectives
Within the first few years following graduation, alumni of the Engineering BS program will:
1. Meet regional workforce needs in engineering
2. Integrate effective workforce skills, best practices and ethical principles
3. Work effectively in multidisciplinary teams and communicate ideas orally and in writing
4. Demonstrate motivation for lifelong learning for personal enrichment and to achieve professional success

Program Outcomes
Students will acquire the knowledge and skills needed to demonstrate the learning outcomes assessed throughout the curriculum. When students graduate, they will be able to:
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i. Recognize the need for, and engage in, lifelong learning
j. Demonstrate knowledge of contemporary issues in engineering
k. Use the techniques, skills and modern engineering tools necessary for engineering practice

Program Requirements
To earn the Bachelor of Science in Engineering from FSU, students must complete a total of 120 credit hours of coursework. Students entering this program must have an associate degree in engineering from a community college and are expected to have completed:
1. 30 credits of general education, to include Freshman Composition, 6 credits in arts and humanities and 6 credits in social sciences
2. Calculus 1, 2 and 3 and Differential Equations
3. Calculus-based physics sequence
4. General Chemistry
5. Engineering coursework, to include Introduction to Engineering Design, Statics, Mechanics of Materials, Dynamics and Thermodynamics

All majors must earn a C or better in the following prerequisite courses for the major requirements at FSU: MATH 236, MATH 237, MATH 238, MATH 432, PHYS 261, PHYS 262, PHYS 263 and PHYS 264.

Once admitted into the program at Cecil College, students will complete an additional 50 credits of engineering and upper-division general education coursework. The majority of the upper-division courses will be taught on site at Cecil College. Several will be delivered via interactive video or through online learning.

FSU Courses (55 hours)
Arts and Humanities GEP course*
IDIS 150 First-Year FSU Colloquium
300- to 400-level Identity and Difference GEP course
ENGL 338 Technical Writing
ENME 331 Fluid Mechanics
ENME 332 Transfer Processes
ENME 350 Electronics and Instrumentation I
ENME 351 Electronics and Instrumentation II
ENME 382 Engineering Materials and Manufacturing
ENME 405 Fundamentals of Materials Engineering
ENME 425 Microfabrication
ENES 401 Fundamentals of Energy Engineering
ENES 491 Seminar
ENEE 408 Capstone Design Project

Three electives from any 300-400 level ENES, ENEE, or ENME course and one additional elective (any)

*For students transferring from Cecil College: Students at FSU are required to have 3 credits in arts and 6 credits in humanities. Since Cecil College requires only 3 credits in arts and humanities (plus EGL 102, which counts as 6 credits of humanities), students will need to complete an additional course in the category in which they are deficient once admitted to FSU.