ENGINEERING (AS)

Award: Associate of Science Degree
No. of credits required: 63-65
For more information: *Contact Assistant Professor Bill Stephens, 443-412-2756,* wstephens@harford.edu*; or Admissions, 443-412-2109; or* stem@harford.edu

Program Description

This curriculum is designed to meet the needs of students who plan to transfer to a college or university that grants a baccalaureate degree in engineering.

Engineers apply the principles of science and mathematics to develop economical solutions to technical problems. Their work is the link between social needs and commercial applications. In addition to design and development, many engineers work in testing, production, or maintenance.

Program Goals

Upon successful completion of the Associate of Sciences, Engineering, degree, the student will be able to:

1. Explain and apply the foundational engineering concepts.
2. Perform laboratory experiments and projects (collect, report and analyze data) by applying theoretical concepts and the scientific method.
3. Demonstrate safe laboratory skills.
4. Recognize and discuss the ethical issues in the discipline.
5. Locate, identify, evaluate and use scientific information effectively.
6. Apply computational skills in reasoning, estimation, problem-solving, and analysis.
7. Use appropriate grammatical forms in both oral and written formats to effectively communicate ideas and concepts.
8. Master the engineering design process by completing a design project and report through teamwork.

Transfer Information

Graduates of this program have transferred to such schools as the University of Maryland, the University of Delaware and The Johns Hopkins University.

Employment Information

This program provides the first two years of a bachelor's degree in engineering. Students should determine, as early as possible, the institution and area of engineering in which they expect to complete the remainder of their work, in order to help meet the specific requirements of that institution for their engineering field. Overall job opportunities in engineering are expected to be favorable over the next decade. Starting salaries are significantly higher than those of college graduates in other fields. Engineers are usually specialized and engage in a variety of activities. Engineering specialties include aeronautical, chemical, civil, mechanical, electrical, biomedical, computer hardware, environmental, industrial and more.

Diversity Requirement

To satisfy the diversity requirement: Associate degree students must complete one 3-credit diversity course (D). It is recommended that students select one of the 3-credit (GB), (GH), (GI) course electives from those that also appear on the approved list of diversity course graduation requirements.

Degree Requirements

Recommended Course Sequence

First Semester		Credits
CHEM 135 or CHEM 111	Chemistry for Engineers [1] or General Chemistry I (GL)	4
ENGR 103	Introduction to Engineering Design	4
ENG 101	English Composition (GE)	3
MATH 203	Calculus I (GM)	4
	Credits	**15**
Second Semester		
MATH 204	Calculus II (GM)	4
PHYS 201	General Physics I: Mechanics (GL)	4
Track Elective (p. 1) [2]		4
Behavioral/Social Science Elective (GB) (https://catalog.harford.edu/general-education/#behavioral-social-science)		3
Arts/Humanities Elective (GH) (https://catalog.harford.edu/general-education/#arts-humanities)		3
	Credits	**18**
Third Semester		
MATH 208	Elementary Differential Equations	3
PHYS 204	General Physics: Vibrations, Waves, Heat, Electricity and Magnetism (GL)	4
Track Elective (p. 1) [2]		4
Behavioral/Social Science Elective (GB) (https://catalog.harford.edu/general-education/#behavioral-social-science)		3
Arts/Humanities Elective (GH) (https://catalog.harford.edu/general-education/#arts-humanities)		3
	Credits	**17**
Fourth Semester		
MATH 206	Calculus III	4
Track Electives (p. 1) [2]		8-10
Physical Education Elective		1
	Credits	**13-15**
	Total Credits	**63-65**

[1] Choose CHEM 135 Chemistry for Engineers only if the transfer institution has an equivalent course and does not require 8 credits of chemistry. If not, choose CHEM 111 General Chemistry I (GL) and then CHEM 112 General Chemistry II A (GL) as a track elective.
[2] Students must complete a total of 16-18 track electives to satisfy requirements of the A.S. in Engineering.

Track Electives

Choose 16 to 18 credits[1]:

Code	Title	Credits
CHEM 112	General Chemistry II A (GL)	4
CHEM 207	Organic Chemistry I	4

CHEM 208	Organic Chemistry II	4
CSI 131	Computer Science I	4
CSI 132	Computer Science II	4
ENGR 104	Statics	3
ENGR 201	Dynamics	3
ENGR 202	Mechanics of Materials	3
ENGR 204	Basic Circuit Analysis	4
ENGR 206	Digital Logic Design	4
ENGR 210	Signals and Systems	4
ENGR 213	Engineering Design with 3D CAD	3
ENGR 215	Chemical Engineering Analysis	3
ENGR 232	Engineering Thermodynamics	3
MATH 210	Discrete Structures	3
MATH 217	Linear Algebra	4
MATH 225	Numerical Methods	3
PHYS 205	General Physics: Electrodynamics, Light Relativity and Modern Physics	4
General Elective		1-4

[1] Track electives are chosen based on the transfer institution and the engineering discipline. Not all electives are offered every semester. Most track electives have prerequisite courses; see the Academic Catalog for course descriptions. The student is encouraged to consult the transfer institution and HCC Advisors to select the track electives.

General Education Degree Requirements

Note: The following codes identify courses which satisfy the General Education Degree Requirements:

Behavioral/Social Science (GB)
English Composition (GE)
Arts/Humanities (GH)
Interdisciplinary and Emerging Issues (GI)
Biological/Physical Laboratory Science (GL)
Mathematics (GM)
Biological/Physical Science (GS)