Engineering Science

What is the Engineering Program?
Engineers use scientific and mathematical principles to solve the technical problems that confront society. Engineers gain their knowledge of science and mathematics through study, experience, and practice, and use this knowledge to design and develop new products, devices, structures and processes.

HCC's Engineering Program is a rigorous program geared for serious students. It is designed to provide the first two years of education for students planning to transfer into an engineering program at a four-year- college or university. The program provides a strong foundation in the physical sciences, engineering science, and mathematics. In addition, the program prepares students for more specialized courses that are taken in the third and fourth years of an engineering program. Students who successfully complete the engineering science curriculum are awarded the degree of Associate of Science in Engineering Science.

What skills are needed to excel in this program?
Engineering students should have a proficiency in math and science and should be self-motivated. Successful engineering students are effective communicators and enjoy working within teams or small groups.

What is the employment outlook for this career?
Employment opportunities in engineering vary by specialty and generally the outlook is good. The U.S. Bureau of Labor Statistics projects that overall engineering employment is expected to grow by 3 percent between 2014 and 2024. According to occupational projections, the growth rate for engineering employment in the state of Maryland is projected to increase by 14.6 percent during the same period.

What types of jobs do engineers perform?
Engineering is a diverse profession and engineers are employed in every major industry. There are many employment paths that an engineer can follow.

Many engineers design and develop new products. During the design process, engineers work in teams to understand the product needs, develop alternatives, and select the most appropriate solution. The engineers will specify functional requirements, design and test the product components, integrate the product components to produce the final design, and evaluate the design's overall performance, cost, reliability, and safety.

In addition to product design and development, other employment paths available to engineers include research, production and testing, construction, operations, sales, management, consulting, teaching, and quality assurance.

Engineering students usually focus their studies on one discipline during the third and fourth years of their engineering education, and generally enter the work force with a bachelor's degree in that discipline.

Some of the most common engineering disciplines are:

- Aerospace
- Biomedical
- Chemical
- Civil
- Electrical/Computer
- Environmental
- Industrial
- Mechanical

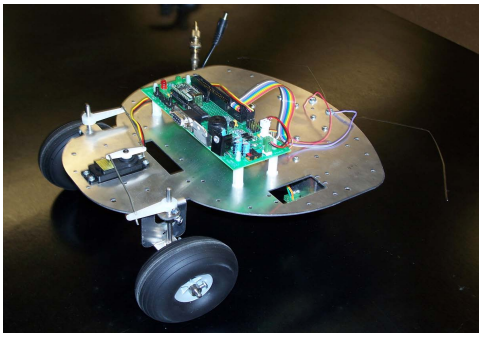
What do engineers earn?
Earnings vary depending on experience, education, geographical location, and engineering discipline. As a group, engineers earn some of the highest average starting salaries among those holding bachelor's degrees.

According to The National Association of Colleges and Employers, the average starting salaries for new college graduates, with degrees in several engineering disciplines are:

- Mechanical engineering $64,890
- Biomedical engineering..... $59,057
- Computer engineering $69,480
- Aerospace/aeronautical/ astronautical $61,180
- Chemical engineering $68,480

What makes HCC's program special?
While completing the Engineering Program, students will have the opportunity to choose from three engineering tracks in chemical/ environmental, electrical/computer, or mechanical/aerospace/civil. Students will have the opportunity to learn and work with the same state-of-the-art engineering modeling and computation software packages that are the standard in many industries, such as PTC CREO and MATLAB.

In addition, HCC engineering students have opportunities to distinguish themselves at prospective four-year-colleges and universities by participating in undergraduate design and research projects such as the Balloon Payload Program in conjunction with Maryland Space Grant Consortium and the Department of Aerospace Engineering at the University of Maryland, College Park.



What are the program options?
Students can earn an associate of science degree in engineering science in one of three tracks or pathways: Track A: Chemical and Environmental; Track B: Electrical and Computer; Track C: Mechanical/Aerospace and Civil. With the completion of this degree, students will have completed the first two years of study toward a bachelor's degree in engineering and be prepared to transfer into an engineering program at a four- year college or university, such as the A. James Clark School of Engineering at University of Maryland, College Park.

A.S. Degree

Engineering Science

The Engineering Science Program provides a sequence of liberal arts and engineering courses for students who plan to transfer into upper-division programs in physics, and any engineering science such as mechanical, electrical, or civil engineering. Students should identify an intended transfer institution as early as possible and complete appropriate courses.

General Education Requirements 32 credits

Arts/Humanities
Select any two courses from the approved Gen Ed List 6

Behavioral/Social Sciences
Select any two courses from the approved Gen Ed List 6

Biological/Physical Science
PHY 203 Principles of Physic I 5
PHY 203 Principles of Physics II 5

Diversity
Select any one course from the approved Gen Ed List 3

English
ENG 101 with a C or better 3

Mathematics
MAT 203 Calculus I 4

Program Requirements ..... 25-28 credits
EGR 103 Intro to Eng Sci 3
CHM 103 General Chemistry I 4
CHM 104 Gen Chem II 4
MAT 204 Calculus II 4
MAT 206 Differential Equations 4

Select a Program Track:

Track A: Chemical/Environmental Engineering
7 Credits
EGR 108 Statics 3
EGR 206 Thermodynamics 3
Suggested Restricted Electives –
ENV 201 Fundamentals of Environmental Studies I. 4
ENV 202 Fundamentals of Environmental Studies II 4
AND/OR
MAT 209 Engineering Programming using MATLAB..... 3

Track B: Electrical/Computer Engineering
8 Credits
EGR 208 Systems and Circuits 4
EGR 210 Digital Logic Design 4

Suggested Restricted Electives –
MAT 209 Engineering Programming using MATLAB..... 3
Any IST (information systems tech) course

Track C: Mechanical/Aerospace and Civil Engineering
9 Credits
EGR 108 Statics 3
EGR 203 Mechanics of Materials 3
EGR 204 Dynamics 3
Suggested Restricted Electives –
EGR 206 Thermodynamics 3
MAT 209 Engineering Programming using MATLAB..... 3

Restricted Electives ..... (4-7 Credits)

Electives should be selected in consultation with an advisor and the transfer institution. Based on your program track, select 4-7 restricted elective credits from the following list:

Any BIO (biology) laboratory course
CHM 203 Organic Chemistry 4
CHM 204 Organic Chemistry 4
Any CSC (computer science) course
EGR 203 Mechanics of Materials 3
EGR 204 Dynamics 3
EGR 206 Thermodynamics 3
EGR 208 Systems and Circuits 4
EGR 210 Digital Logic Design 4
EGR 211 Elements of Discrete Signal Analysis 4
ENV 201 Fundamentals of Environmental Studies I. 4
ENV 202 Fundamentals of Environmental Studies II 4
Any IST (information systems tech) course
MAT 209 Engineering Programming using MATLAB 3
MAT 161 Precalculus 4
PHY 205 Principles of Physics III 1

Degree Requirement ..... 64 credits

**Student progress in this curriculum requires the ability to function at the pre-calculus level.*

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Useful Links:

National Society of Professional Engineers
www.nspe.org

American Society of Mechanical Engineers
www.asme.org

Institute of Electrical and Electronics Engineers
www.ieee.org

Association of Chemical Engineers
www.aiche.org

American Society of Civil Engineers
www.asce.org

American Institute of
Aeronautics and Astronautics
www.aiaa.org

American Academy of Environmental
Engineers and Scientists
www.asees.org