

# Engineering

## Engineering Degrees and Certificates

### Engineering, Associate in Science

The Engineering, A.S. is focused on providing students with the first two years of a baccalaureate degree in engineering. The program is designed to educate students to meet the challenge of engineering in an ever-changing world and to foster understanding of universal topics in engineering. At the baccalaureate degree level, students can choose to specialize in one of the following engineering disciplines:

- Civil Engineering
- Industrial Engineering
- Mechanical Engineering

For additional program information, contact faculty advisor, Al Jou, at (609)343-4966 or [ajou@atlanticcape.edu](mailto:ajou@atlanticcape.edu), or contact area coordinator, Michele Leacott, at (609)343-5044 or [mleacott@atlanticcape.edu](mailto:mleacott@atlanticcape.edu).

**Upon completion of this program students will be able to:**

- Define engineering and identify common engineering fields;
- Design engineering graphics;
- Identify the characteristics of forces and couples;
- Explain the concepts of stress and strain;
- Describe kinematics and kinetics of particles and rigid bodies.

(ENGR-Fall 2022)

## General Education Courses

When a course is not specified, refer to the list of approved General Education courses.

### Communication

Course #	Title	Credits
ENGL101	Composition I	3
ENGL102	Composition II	3

### Mathematics-Science-Technology

Course #	Title	Credits
CHEM110	General Chemistry I	4
CISM125	Introduction to Computers	3
MATH155	Calculus I	4
PHYS225	General Physics I	4

### Social Science

Course #	Title	Credits
	Choose: ECON110, PSYC101 or SOCL101 (3 credits)	3

# Humanities

Course #	Title	Credits
ENGL104	Introduction to Literature	3

## General Education Elective

Course #	Title	Credits
	Choose: ARTS103, ARTS115, MUSC100, PSYC101, SOCL101 or THEA110 (3 credits)	3

## Program Courses

Course #	Title	Credits
ENGR101	Introduction to Engineering	2
ENGR200	Engineering Design	3
ENGR201	Statics	3
ENGR204	Dynamics	3
MATH156	Calculus II	4
MATH255	Calculus III	4
MATH256	Differential Equations	4
PHYS226	General Physics II	4
	Choose: ENGR203-Computing for Engineers or ENGR202-Mechanics of Materials (3 credits)	3
<b>Total Credits</b>		<b>60</b>

## Recommended Sequence of Courses

### First Semester

Course #	Title	Credits
CISM125	Introduction to Computers	3
ENGL101	Composition I	3
ENGR101	Introduction to Engineering	2
MATH155	Calculus I	4
PHYS225	General Physics I	4

### Second Semester

Course #	Title	Credits
ENGL102	Composition II	3
ENGL104	Introduction to Literature	3
ENGR200	Engineering Design	3
MATH156	Calculus II	4
PHYS226	General Physics II	4

## Third Semester

Course #	Title	Credits
CHEM110	General Chemistry I	4
ENGR201	Statics	3
MATH255	Calculus III	4
	Choose: ECON110, PSYC101 or SOCL101 (3 credits)	3

## Fourth Semester

Course #	Title	Credits
ENGR204	Dynamics	3
MATH256	Differential Equations	4
	Choose: ENGR203-Computing for Engineers or ENGR202-Mechanics of Materials (3 credits)	3
	Choose: ARTS103, ARTS115, MUSC100, PSYC101, SOCL101 or THEA110 (3 credits)	3

# Engineering Courses

## ENGR101 : Introduction to Engineering

Provides a broad introduction to the engineering profession for those with little or no prior exposure to the subject while providing a foundation for additional study in engineering. Students are introduced to the engineering profession and different disciplines of engineering. The interdependency of these disciplines will also be explored through the completion of projects that require input from several disciplines of engineering.

**Credits** 2

**Lecture Hours** 2

**Lab/Clinical/Field Study Hours** 0

**Prerequisites**

MATH074 or MATH099 (may be taken concurrently).

## ENGR125 : Introduction to Electronics

Provides a comprehensive introduction to electronics. The coursework places emphasis on the fundamental theories and laws required for understanding electronics. Learning activities focus on the entry-level skills required in the field of electronics. It also provides an opportunity for students to develop a working vocabulary of key terminology. Lecture and laboratory topics include developing a comprehensive foundation of direct current and alternating current circuits, the basic skills of circuit analysis, design, and testing, Ohm's and Kirchhoff's Laws.

**Credits** 4

**Lecture Hours** 3

**Lab/Clinical/Field Study Hours** 3

**Prerequisites**

MATH074 or MATH099 or Placement Test score.

## ENGR200 : Engineering Design

Designed to teach students freehand pencil sketching and visualization skills that will be used throughout their academic years and their professional career. Students are introduced to a computer-aided design program predominately used by engineers.

**Credits** 3

**Lecture Hours** 3

**Lab/Clinical/Field Study Hours** 0

**Prerequisite Courses**

ENGR101: Introduction to Engineering

## ENGR201 : Statics

An introduction to the concepts and characteristics of forces and couples. Topics include but are not limited to distributed forces, center of mass, equilibrium of particles and rigid bodies. Additional topics include trusses and frames, internal forces, shear, moment distribution in beams and area moments of inertia.

**Credits** 3

**Lecture Hours** 3

**Lab/Clinical/Field Study Hours** 0

**Prerequisites**

MATH155 or PHYS225 with a grade of C or better

## ENGR202 : Mechanics of Materials

Introduces students to the concepts of stress and strain and their tensor properties. Topics include but are not limited to elastic stress strain relations, analysis of stress and deformation in members subject to axial, torsional, bending and combined loading and column stability.

**Credits** 3

**Lecture Hours** 3

**Lab/Clinical/Field Study Hours** 0

**Prerequisites**

ENGR201 with a grade of C or better

## ENGR203 : Computing for Engineers

This course is an introduction to a powerful programming language and development environment for engineers and scientists. Programming concepts are illustrated with various engineering application examples. Topics of study include the programming environment, plotting, manipulating matrices, operators, built-in functions, user-defined functions, user controlled input and output, relational and logical operators, repetition structures, symbolic mathematics and numerical methods.

**Credits** 4

**Lecture Hours** 4

**Lab/Clinical/Field Study Hours** 0

**Prerequisites**

MATH150

## ENGR204 : Dynamics

Covers kinematics and kinetics of particles and rigid bodies. Topics also include but are not limited to acceleration, work, energy, power, impulse and momentum.

**Credits** 3

**Lecture Hours** 3

**Lab/Clinical/Field Study Hours** 0

**Prerequisites**

ENGR201 with a grade of C or better