

Engineering (414)

Associate of Engineering Science

About Our Program

This program is intended to provide the first two years of a four-year baccalaureate program. Students in this major will study mathematics and science with the intent of applying the principles of those fields to the design and construction of useful devices and structures. Specialty areas of engineering include aeronautical, agricultural, biological, chemical, civil, computer, electrical, industrial, manufacturing, material, mechanical, mining, and nuclear.

PROGRAM OUTCOMES

- Students should be able to understand and employ aspects of scientific methodologies.
- Students should practice proper lab technique in compliance with relevant safety standards.
- Students should understand the fundamental uncertainties in experimental measurements inherent in different laboratory techniques and instrumentation.
- Students should be able to analyze data sets and communicate information in a clear and organized manner with presentations and properly cited written reports.
- Students should utilize peer-reviewed scientific literature effectively.
- Students should be able to work with peers in a team setting.
- Students should be able to relate contemporary societal and global issues to the physical and life sciences.

Nature of Work and Employment

Engineers work in a wide variety of settings such as industries, research facilities, consulting firms, and governmental agencies.

Special Considerations

Those interested in engineering should have an aptitude for science, mathematics, problem solving, and versatility. Good verbal and written skills, and the ability to work on a team are also needed. The guideline listed is recommended only. Students should check with a student advisor for specific university requirements in this major. Each student must meet with an advisor to ensure that the special requirements of the department and the institution to which they plan to transfer are fully met.

Program Contacts

Call Highland at 815-235-6121 for the following program contacts:

- Dr. Brendan Dutmer, Dean, Natural Science and Mathematics
- David Esch, Physics/Engineering Faculty
- Beth Groshans, Student Advisor

Recommended Courses

The following are recommended courses for this major only. Students must still meet all requirements for the Associate of Engineering Science degree (see page 60) in order to graduate from Highland Community College. For more information, please see your student advisor.

Prerequisite Mathematics

*	MATH	250	Analytic Geometry & Calculus I	5
*	MATH	255	Analytic Geometry & Calculus II	5
*	MATH	269	Analytic Geometry & Calculus III	4
*	MATH	265	Differential Equations	3

Prerequisite Science

*	CHEM	123	General College Chemistry I	5
*	INFT	190	Principles of Computer Science I	3
*	PHYS	143	General Physics I	4
*	PHYS	144	General Physics II	4

Engineering Specialty

*	CHEM	124	General College Chemistry II	5
*	CHEM	221	Organic Chemistry I	4
*	CHEM	222	Organic Chemistry II	4
	GEOL	126	Geology	4
*	INFT	290	Principles of Computer Science II	3
*	MATH	270	Linear Algebra	3
	PHYS	120	Introduction to Engineering	2
*	PHYS	145	General Physics III	3
*	PHYS	221	Statics	3
*	PHYS	222	Dynamics	3
*	PHYS	246	Introduction to Circuit Analysis	4

* Course has a prerequisite. See course description.

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Associate of Engineering Science Degree Considerations

Engineering programs are highly structured to meet the Accreditation Board for Engineering and Technology (A.B.E.T.) standards required for registration as a professional engineer. To transfer as a junior, the Prerequisite courses must be complete.

Engineering students who will not be able to complete the necessary Prerequisite courses for the Associate of Engineering Science degree are encouraged to pursue an Associate of Science degree while completing as many suitable Prerequisites and Engineering Specialty courses as possible.

Some physics and chemistry students immediately ready for the calculus sequence may find the Associate of Engineering Science degree matches the first two years of their baccalaureate program as well as or better than the Associate of Science degree.

Students are encouraged to complete the entire course sequence in Physics (I, II, III), Chemistry (I, II) and Computer Science (I, II) before transfer, since topics are covered in different orders by different schools. Verify with the transfer institution that these required Science courses are sufficient as Prerequisites. Additional sequential courses or credit hours may also transfer for Technical elective credits.

Students should decide on an Engineering specialty and preferred transfer school by the beginning of the sophomore year since course requirements vary by specialty and by school.

Be sure to select your courses in consultation with an Engineering advisor at Highland and with an Engineering advisor at the transfer school if possible. Consultation with Engineering, Math, and Science faculty at Highland is also recommended.

Some programs have a Life Science general education requirement or have specific Life Science course requirements. Check transfer school for details.

RECOMMENDED SPECIALTY COURSES

Chemical Engineering

CHEM	124	General College Chemistry II	5
CHEM	221	Organic Chemistry I	4
CHEM	222	Organic Chemistry II	4
PHYS	145	General Physics III	3
MATH	270	Linear Algebra	3

Civil and Environmental Engineering

PHYS	221	Statics	3
PHYS	222	Dynamics	3
CHEM	124	General College Chemistry II	5
MATH	270	Linear Algebra	3
PHYS	145	General Physics III	3

Computer Engineering

INFT	290	Principles of Computer Science II	3
PHYS	145	General Physics III	3
PHYS	246	Introduction to Circuit Analysis	4
MATH	270	Linear Algebra	3
CHEM	124	General College Chemistry II	5

Electrical Engineering

PHYS	145	General Physics III	3
PHYS	246	Introduction to Circuit Analysis	4
MATH	270	Linear Algebra	3
CHEM	124	General College Chemistry II	5
INFT	290	Principles of Computer Science II	3

Industrial Engineering

PHYS	221	Statics	3
PHYS	222	Dynamics	3
PHYS	246	Introduction to Circuit Analysis	4
MATH	270	Linear Algebra	3
PHYS	145	General Physics III	3

Mechanical Engineering (Aeronautical & Manufacturing)

PHYS	221	Statics	3
PHYS	222	Dynamics	3
PHYS	246	Introduction to Circuit Analysis	4
MATH	270	Linear Algebra	3
PHYS	145	General Physics III	3

Other Engineering Specialties (Examples Include: Agricultural, Biological, Material Sciences, Mining, Nuclear). See transfer institutions for guidance with appropriate choice of Engineering Specialty courses.

MINIMUM HOURS FOR DEGREE:

67 Credit Hours

- Completion of the Associate in Engineering Science (A.E.S.) degree does not fulfill the requirements of the Illinois Transferable General Education Core Curriculum (IAI GECC). Completion of the general education requirements of the transfer school will be necessary.
- A total of 67 semester hours is required (68 recommended) for the Associate of Engineering Science degree.
- Courses labeled "T" in the college catalog are the most transferable. A grade of C or better may be required for physics, chemistry, mathematics, and engineering science courses to transfer. A similar policy may exist for general education courses.
- Please see your advisor when choosing electives.