# ASSOCIATE OF ENGINEERING SCIENCE DEGREE REQUIREMENTS

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 listed must be completed.

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 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 be transferred for technical elective credits.

## Communications

**6 Semester Hours**

| Code | Title | Hours |
|---|---|---|
| ENGL 121 | Rhetoric and Composition I [1] | 3 |
| ENGL 122 | Rhetoric and Composition II [1] | 3 |

[1] A grade of "C" or better is required.

## Humanities and Fine Arts & Social and Behavioral Sciences & Communications

**12 Semester Hours**

- One course must be chosen from Humanities & Fine Arts.
- One course must be chosen from the Social and Behavioral Sciences.
- 12 credit hours must be general education credits (IAI GECC) from the lists below.
- If two courses are selected in a field, a two-semester sequence in the same discipline is recommended.
- ECON 112 Principles of Economics II (Micro) is required for Industrial Engineering and recommended for other Engineering specialties.

### Humanities

| Code | Title | Hours |
|---|---|---|
| ENGL 223 | Introduction to Fiction | 3 |
| ENGL 224 | Introduction to Poetry | 3 |
| ENGL 225 | American Literature I | 3 |
| ENGL 226 | American Literature II | 3 |
| ENGL 227 | British Literature I | 3 |
| ENGL 228 | British Literature II | 3 |
| ENGL 229 | Introduction to Shakespeare | 3 |
| ENGL 230 | Women in Literature [D] | 3 |
| ENGL 231 | Intro to Children's Literature | 3 |
| ENGL 232 | Ethnic Literature from the US [D] | 3 |
| HUMA 104 | Introduction to Humanities | 3 |
| HUMA 110 | Intro to Critical Thinking | 3 |
| HUMA 130 | American Culture Studies | 3 |
| HUMA 140 | African & Middle Eastern Human [N] | 3 |
| PHIL 180 | World Religions [D] | 3 |
| PHIL 281 | Introduction to Philosophy | 3 |
| PHIL 282 | Ethics | 3 |

### Fine Arts

| Code | Title | Hours |
|---|---|---|
| ART 110 | Introduction to Art | 3 |
| ART 215 | Art History I | 3 |
| ART 216 | Art History II | 3 |
| ART 219 | Modern Art | 3 |
| HUMA 104 | Introduction to Humanities | 3 |
| HUMA 130 | American Culture Studies | 3 |
| MCOM 150 | Introduction to Film | 3 |
| MCOM 205 | Film History and Appreciation | 3 |
| MCOM 210 | Film History I | 3 |
| MCOM 215 | Film History II | 3 |
| MUS 267 | Introduction To Music | 3 |
| MUS 268 | Music Of The USA | 3 |
| THEA 104 | Cultural Diversity in Perf. [D] | 3 |
| THEA 196 | Introduction to Theatre | 3 |

### Social and Behavioral Sciences

| Code | Title | Hours |
|---|---|---|
| ECON 111 | Principles of Economics I | 3 |
| ECON 112 | Principles of Economics II | 3 |
| GEOG 132 | Regional Geography of World | 3 |
| GEOG 233 | Economic Geography | 3 |
| HIST 125 | World Civilizations I [N] | 3 |
| HIST 126 | World Civilizations II [N] | 3 |
| HIST 141 | Western Civilization to 1648 | 3 |
| HIST 142 | Western Civ 1648 to Present | 3 |
| HIST 143 | U.S. History I | 3 |
| HIST 144 | U.S. History II | 3 |
| HIST 243 | History of Africa I [N] | 3 |
| HIST 244 | History of Africa II [N] | 3 |
| HIST 245 | History of the Middle East [N] | 3 |
| POL 151 | Introduction Political Science | 3 |
| POL 152 | American Government & Politics | 3 |
| POL 153 | State and Local Government | 3 |
| POL 253 | International Relations | 3 |
| POL 254 | Intro Comparative Government | 3 |
| PSY 161 | Introduction to Psychology | 3 |
| PSY 162 | Child Psychology | 3 |
| PSY 262 | Human Growth\Development | 3 |

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| PSY 264 | Social Psychology | 3 |
| SOCI 171 | Introduction Sociology | 3 |
| SOCI 177 | Introduction to Anthropology [N] | 3 |
| SOCI 234 | Gender and Society [D] | 3 |
| SOCI 271 | Social Problems | 3 |
| SOCI 274 | The Family | 3 |
| SOCI 276 | Racism & Diversity/Contemp Soc [D] | 3 |

### Communications

| Code | Title | Hours |
|---|---|---|
| SPCH 191 | Fund of Speech Communication | 3 |

D or N Select at least one course that emphasizes Diversity or Non-Western culture.

# Science, Technology, Engineering & Mathematics Prerequisites and Specialty Courses

## Prerequisite Courses

**33 Semester Hours**

### Required Mathematics

| Code | Title | Hours |
|---|---|---|
| MATH 250 | Analytic Geometry/Calculus I | 5 |
| MATH 255 | Analytic Geometry/Calculus II | 5 |
| MATH 265 | Differential Equations | 3 |
| MATH 269 | Analytic Geometry/Calculus III | 4 |

### Required Science

| Code | Title | Hours |
|---|---|---|
| CHEM 123 | General College Chemistry I | 5 |
| INFT 190 | Prin of Computer Science I | 3 |
| PHYS 143 | General Physics I | 4 |
| PHYS 144 | General Physics II | 4 |

# Engineering Specialty Courses

**11 Semester Hours**

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

Be sure to select your courses in consultation with an Engineering advisor at Highland and an Engineering advisor at the transfer school, if possible. Consultation with Highland's Engineering, Math, and Science faculty is also recommended. Some programs have a Life Science general education requirement or specific Life Science course requirements. Check the transfer school for details.

## Engineering Specialty Course List

| Code | Title | Hours |
|---|---|---|
| CHEM 124 | General College Chemistry II | 5 |
| CHEM 221 | Organic Chemistry I | 5 |
| CHEM 222 | Organic Chemistry II | 5 |
| INFT 290 | Prin of Computer Science II | 3 |
| MATH 270 | Linear Algebra | 3 |
| PHYS 120 | Introduction to Engineering | 2 |
| PHYS 145 | General Physics III | 4 |
| PHYS 221 | Mechanics I (Statics) | 3 |
| PHYS 222 | Mechanics II (Dynamics) | 3 |

### Chemical Engineering

| Code | Title | Hours |
|---|---|---|
| CHEM 124 | General College Chemistry II | 5 |
| CHEM 221 | Organic Chemistry I | 5 |
| CHEM 222 | Organic Chemistry II | 5 |
| MATH 270 | Linear Algebra | 3 |

### Civil and Environmental Engineering

| Code | Title | Hours |
|---|---|---|
| CHEM 124 | General College Chemistry II | 5 |
| PHYS 221 | Mechanics I (Statics) | 3 |
| PHYS 222 | Mechanics II (Dynamics) | 3 |
| MATH 270 | Linear Algebra | 3 |

### Computer Engineering

| Code | Title | Hours |
|---|---|---|
| INFT 290 | Prin of Computer Science II | 3 |
| PHYS 145 | General Physics III | 4 |
| CHEM 124 | General College Chemistry II | 5 |
| MATH 270 | Linear Algebra | 3 |

### Electrical Engineering

| Code | Title | Hours |
|---|---|---|
| PHYS 145 | General Physics III | 4 |
| MATH 270 | Linear Algebra | 3 |
| CHEM 124 | General College Chemistry II | 5 |
| INFT 290 | Prin of Computer Science II | 3 |

### Industrial Engineering

| Code | Title | Hours |
|---|---|---|
| PHYS 221 | Mechanics I (Statics) | 3 |
| PHYS 222 | Mechanics II (Dynamics) | 3 |
| INFT 290 | Prin of Computer Science II | 3 |
| MATH 270 | Linear Algebra | 3 |

### Mechanical Engineering (Aeronautical & Manufacturing)

| Code | Title | Hours |
|---|---|---|
| PHYS 221 | Mechanics I (Statics) | 3 |
| PHYS 222 | Mechanics II (Dynamics) | 3 |
| CHEM 124 | General College Chemistry II | 5 |
| MATH 270 | Linear Algebra | 3 |

For other Engineering Specialties (examples include: Agricultural, Biological, Material Sciences, Mining, Nuclear), see transfer institutions for guidance with the appropriate choice of Engineering Specialty courses.

## Minimum Hours for Degree:

**67 Semester 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 may 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 courses to transfer. A similar policy may exist for general education courses.
- Please see your advisor when choosing electives.

# General Education Institutional Outcomes

## Written Communication:

Students will be able to produce written work that displays college-level skills, insight, and critical thinking through meaningful and appropriate content.

## Oral Communication:

Students will be able to prepare and deliver a purposeful presentation designed to increase knowledge, to foster understanding, or to promote change in the listeners' attitudes, values, beliefs, or behaviors.

## Critical Thinking:

Students will be able to evaluate and create arguments that consider a variety of issues, ideas, artifacts, and events.

## Quantitative Literacy:

Students will demonstrate the ability to reason and solve quantitative problems from a wide array of authentic contexts and everyday life situations.

## Information Literacy:

Students will engage in reflective discovery of information, evaluate information based on an understanding of how it is produced and valued, synthesize information to create new knowledge and participate ethically in communities of learning.

## Diversity:

Students will recognize diversity in the global community and model culturally competent civic and social participation.