# GENERAL ENGINEERING, BACHELOR OF ARTS

Our time has already seen the rapid development of a broad range of technological, scientific and engineering innovations which shape the way in which contemporary society functions. The pace of these developments will become even faster and more global in this century. The Bachelor of Arts in General Engineering is designed to provide students with the fundamental engineering principles needed to understand the basics of, and to work with, modern technology, innovations, and engineering practices.

The B.A. degree with a major in General Engineering is intended for undergraduate students who desire a background in engineering and technology yet have neither the desire nor the intention to become practicing engineers. These students may, for example, plan to pursue graduate or professional study in architecture, business, law (e.g., intellectual property, patent law), or medicine. They may wish to work in areas which relate to engineering and technology such as public policy or to thrive in the global industrial economy. The Bachelor of Arts in General Engineering combines a foundation in engineering with liberal arts coursework.

This program is **not** accredited by the Accreditation Board for Engineering and Technology. Students desiring careers as licensed, professional engineers should complete a B.S. degree in one of the engineering disciplines offered by the Whiting School.

For more information about the program, students can view the General Engineering website (https://engineering.jhu.edu/education/undergraduate-studies/general-engineering/).

***The information below describes the academic requirements for students entering JHU as degree-seeking students in Fall 2025. Students who entered JHU as degree-seeking students prior to Fall 2025 should view the appropriate*** archived catalogue ***(***https://e-catalogue.jhu.edu/archive/***).***

Students must meet the University requirements and the Whiting School of Engineering requirements (see Requirements for a Bachelor's Degree (https://e-catalogue.jhu.edu/ksas-wse/undergraduate-policies/academic-policies/requirements-bachelors-degree/) in this catalogue), as well as the departmental major requirements, to complete a bachelor's degree.

- The Bachelor of Arts degree in General Engineering requires 120 credits.
- Students are required to have a minimum cumulative Grade Point Average of 2.0 to graduate. Grades of C- or higher are required to apply for FA requirements; otherwise, a maximum of 12 D credits may be counted towards degree requirements.
- No Departmental Honors are granted.
- All undergraduate students majoring in the Bachelor of Arts in General Engineering must follow a program approved by their professional academic advisor. The academic advisor will be based in the Office of Engineering Advising (OEA).

# UNIVERSITY REQUIREMENTS

**These requirements are described in this section of the** catalogue **(**https://e-catalogue.jhu.edu/ksas-wse/undergraduate-policies/academic-policies/requirements-bachelors-degree/**).**

# WSE SCHOOL REQUIREMENTS

## FIRST-YEAR SEMINAR OR DESIGN CORNERSTONE REQUIREMENT

All WSE primary majors are required to complete a First-Year Seminar (FYS) or a Design Cornerstone class with a grade of Satisfactory (S).

The first-year seminar requirement is waived for students who transfer into the university after the first year. These students must still complete the minimum number of required credits to graduate.

| Code | Title | Credits |
|---|---|---|
| One FYS or Design Cornerstone course | | 2-3 |
| *Total Credits* | | *2-3* |

## FOUNDATIONAL ABILITIES REQUIREMENTS

All students with a primary major within the Whiting School of Engineering must complete the Foundational Abilities (https://e-catalogue.jhu.edu/ksas-wse/undergraduate-policies/academic-policies/requirements-bachelors-degree/#writingtext) (FA) in six designated areas. Grades of C- or higher are required. No Satisfactory/Unsatisfactory (S/U) grades will be accepted, except in cases where a course is offered on an S/U basis only, such as the Bootcamp Computing courses. For Foundational Abilities that require the submission of ePortfolio assignments in an engineering discipline, students must achieve a minimum assessment of "Proficient".

### FA1 WRITING AND COMMUNICATION

This Foundational Abilities requirement has four parts:

**1. Foundational Course in Writing:** All WSE students are required to successfully complete one foundational course in writing. Courses that will satisfy the writing course requirement are listed below:

| Code | Title | Credits |
|---|---|---|
| Choose one from the following: | | |
| AS.004.101 | Reintroduction to Writing | 3 |
| EN.661.110 | Professional Writing and Ethics | 3 |

**2. Writing ePortfolio Assignment:** All WSE students must be assessed as at least proficient in one or more writing ePortfolio assignments. Courses that include at least one assignment eligible for the writing ePortfolio assignment requirement can be identified in SIS (https://sis.jhu.edu/sswf/) by searching the tag listed below:

| Code | Title | Credits |
|---|---|---|
| EN Foundational Ability tag FA1.1eP | | |

**3. Foundational Course in Oral Communication:** All WSE students are required to successfully complete one foundational course in oral communication. The course that will satisfy the oral communication course requirement is listed below:

| Code | Title | Credits |
|---|---|---|
| EN.661.250 | Oral Presentations | 3 |

**4. Oral Communication ePortfolio Assignment:** All WSE students must be assessed as at least proficient in one or more oral communication ePortfolio assignments. Courses that include at least one assignment applicable to the oral communication ePorfolio assignment requirement

can be identified in SIS (https://sis.jhu.edu/sswf/) by searching the tag listed below:

| Code | Title | Credits |
|---|---|---|
| EN Foundational Ability tag FA1.2eP | | |

## FA2 SCIENTIFIC AND QUANTITATIVE REASONING

This Foundational Abilities requirement has five parts. The General Engineering has specified the courses below that will satisfy the requirements.

**1. Calculus I:** Calculus I applies to both the FA2 requirement and the General Engineering mathematics requirement.

| Code | Title | Credits |
|---|---|---|
| AS.110.108 | Calculus I (Physical Sciences & Engineering) | 4 |
| or AS.110.106 | Calculus I (Biology and Social Sciences) | |

**2. Calculus II:** Calculus II applies to both the FA2 requirement and the General Engineering mathematics requirement.

| Code | Title | Credits |
|---|---|---|
| AS.110.109 | Calculus II (For Physical Sciences and Engineering) | 4 |
| or AS.110.107 | Calculus II (For Biological and Social Science) | |

**3. Probability and Statistics:** Students may choose either one combined course or two separate courses to satisfy this requirement. The Probability and Statistics course(s) apply to both the FA2 requirement and the General Engineering mathematics requirement.

| Code | Title | Credits |
|---|---|---|
| *One Combined Course Option* | | |
| Choose one from the following: | | |
| EN.553.211 | Probability and Statistics for the Life Sciences | 4 |
| EN.553.311 | Intermediate Probability and Statistics | 4 |
| *Two Separate Courses Option* | | |
| Choose one from the following: | | |
| EN.553.420<br>& EN.553.430 | Probability<br>and Mathematical Statistics | 8 |
| EN.553.421<br>& EN.553.431 | Honors Probability<br>and Honors Mathematical Statistics | 8 |

**4. Computing and Data Science:** The computing course applies to both the FA2 requirement and the General Engineering Computer Language requirement.

| Code | Title | Credits |
|---|---|---|
| Choose one from the following: | | |
| EN.500.112 | Gateway Computing: JAVA | 3 |
| EN.500.113 | Gateway Computing: Python | 3 |
| EN.601.220 | Intermediate Programming | 4 |

**5. Natural Science and Laboratory:** The natural science course with its associated laboratory will satisfy the FA2 requirement and the General Engineering Basic Sciences requirement. Additional natural science lectures and labs are required for the major; see the Major Requirements section for details.

| Code | Title | Credits |
|---|---|---|
| Choose one from the following: | | |
| AS.020.151<br>& AS.020.153 | General Biology I<br>and General Biology Laboratory I | 4 |
| AS.020.152<br>& AS.020.154 | General Biology II<br>and General Biology Lab II | 4 |
| AS.030.101<br>& AS.030.105 | Introductory Chemistry I<br>and Introductory Chemistry Laboratory I | 4 |
| AS.030.102<br>& AS.030.106 | Introductory Chemistry II<br>and Introductory Chemistry Laboratory II | 4 |
| AS.171.101<br>& AS.173.111 | General Physics: Physical Science Major I<br>and General Physics Laboratory I | 5 |
| AS.171.102<br>& AS.173.112 | General Physics: Physical Science Major II<br>and General Physics Laboratory II | 5 |
| AS.171.107<br>& AS.173.111 | General Physics for Physical Sciences Majors (AL)<br>and General Physics Laboratory I | 5 |
| AS.171.108<br>& AS.173.112 | General Physics for Physical Science Majors (AL)<br>and General Physics Laboratory II | 5 |

## FA3 CREATIVE EXPRESSION

A minimum of 12 credits of coursework in creative expression (FA3) and engagement with society (FA4) is required. At least three of these credits must be earned through a course tagged FA3. Courses with the FA3 tag can be identified in SIS (https://sis.jhu.edu/sswf/) by searching the tag listed below:

| Code | Title | Credits |
|---|---|---|
| EN Foundational Ability tag FA3 [1] | | 3 |

[1] Students pursuing Bachelor of Arts General Engineering must complete at least one 3-credit 300-level course in an FA3 or FA4 area as part of their completion of the 12 credits earned toward this requirement.

In addition to the required FA3 and FA4 courses, students must complete six additional credits from any combination of FA3 or FA4 courses, for a total of 12 credits in FA3 and FA4.

## FA4 ENGAGEMENT WITH SOCIETY

A minimum of 12 credits of coursework in creative expression (FA3) and engagement with society (FA4) is required. At least three of these credits must be earned through a course tagged FA4. Courses with the FA4 tag can be identified in SIS (https://sis.jhu.edu/sswf/) by searching the tag listed below:

| Code | Title | Credits |
|---|---|---|
| EN Foundational Ability tag FA4 [1] | | 3 |

[1] Students pursuing Bachelor of Arts General Engineering must complete at least one 3-credit 300-level course in an FA3 or FA4 area as part of their completion of the 12 credits earned toward this requirement.

In addition to the required FA3 and FA4 courses, students must complete six additional credits from any combination of FA3 or FA4 courses, for a total of 12 credits in FA3 and FA4.

## FA5 ETHICAL REFLECTION

This Foundational Abilities requirement has two parts:

**1. Foundational Course in Ethical Reflection:** All WSE students are required to successfully complete one foundational course in ethical

reflection. Courses that will satisfy the ethical reflection course requirement can be identified in SIS (https://sis.jhu.edu/sswf/) by searching the tag listed below:

| Code | Title | Credits |
|---|---|---|
| EN Foundational Ability tag FA5 | | |

**2. Ethical Reflection ePortfolio Assignment:** All WSE students must be assessed as at least proficient in one or more ethical reflection ePortfolio assignments. Courses that include at least one assignment eligible for the ethical reflection ePortfolio assignment requirement can be identified in SIS (https://sis.jhu.edu/sswf/) by searching the tag listed below:

| Code | Title | Credits |
|---|---|---|
| EN Foundational Ability tag FA5eP | | |

### FA6 CONCEIVING OF AND REALIZING PROJECTS

All WSE students must be assessed as at least proficient in two or more conceiving of and realizing projects ePortfolio assignments. Courses that include at least one assignment eligible for the conceiving of and realizing projects ePortfolio assignment requirement can be identified in SIS (https://sis.jhu.edu/sswf/) by searching the tag listed below:

| Code | Title | Credits |
|---|---|---|
| EN Foundational Ability tag FA6eP | | |

# MAJOR REQUIREMENTS

## MATHEMATICS

A minimum of five courses (at least 3 credits each) in mathematics is required. If a student receives a waiver for Calculus I and/or Calculus II, they must make up the waived credits by completing additional mathematics courses approved by their professional academic advisor.

Grades of C- or higher are required to apply for FA2 requirements; otherwise, grades of D or higher are required. No Satisfactory/ Unsatisfactory (S/U) grades will be accepted.

| Code | Title | Credits |
|---|---|---|
| AS.110.108 | Calculus I (Physical Sciences & Engineering) (FA2 Requirement) | 4 |
| or AS.110.106 | Calculus I (Biology and Social Sciences) | |
| AS.110.109 | Calculus II (For Physical Sciences and Engineering) (FA2 Requirement) | 4 |
| or AS.110.107 | Calculus II (For Biological and Social Science) | |
| One Probability and Statistics Course (FA2 Requirement) | | 4-8 |
| Choose one from the following: | | |
| EN.553.211 | Probability and Statistics for the Life Sciences | |
| EN.553.311 | Intermediate Probability and Statistics | |
| EN.553.420 & EN.553.430 | Probability and Mathematical Statistics | |
| EN.553.421 & EN.553.431 | Honors Probability and Honors Mathematical Statistics | |
| One course from Math (AS.110.xxx) or Applied Math & Statistics (EN.553.xxx) department at any level | | |
| One course from Math (AS.110.xxx) or Applied Math & Statistics (EN.553.xxx) department at 200-level or higher | | |

## BASIC SCIENCES

A total of four lecture courses and two laboratory courses in basic sciences are required. Course waivers will not fulfill lab requirements. One physics or natural science lecture and its associated laboratory will apply to both the FA2 requirement and the General Engineering Basic Sciences requirement.

Grades of C- or higher are required to apply for FA2 requirements; otherwise, grades of D or higher are required. No Satisfactory/ Unsatisfactory (S/U) grades will be accepted.

| Code | Title | Credits |
|---|---|---|
| Complete one physics lecture course from the following: | | |
| AS.171.101 | General Physics: Physical Science Major I | 4 |
| AS.171.103 | General Physics I for Biological Science Majors | 4 |
| AS.171.105 | Classical Mechanics I | 4 |
| AS.171.107 | General Physics for Physical Sciences Majors (AL) | 4 |
| EN.530.123 | Introduction to Mechanics I | 3 |
| Complete one natural science lecture from the following: | | |
| AS.020.151 | General Biology I | 3 |
| AS.030.101 | Introductory Chemistry I | 3 |
| Complete one laboratory from the following: | | |
| AS.020.153 | General Biology Laboratory I | 1 |
| AS.030.105 | Introductory Chemistry Laboratory I | 1 |
| AS.173.111 | General Physics Laboratory I | 1 |
| Two additional natural science lectures with N area designation [1] | | 6 |
| One additional laboratory with N area designation [1] | | 1 |

1. If a student takes AS.030.103 Applied Chemical Equilibrium and Reactivity w/lab, it can be used to satisfy one of the additional lectures **AND** one additional required lab course requirement.

## INTERNATIONAL DIMENSIONS OF ENGINEERING

Students must demonstrate competence in addressing technical issues within the context of another society by completing one of three options.

| Code | Title | Credits |
|---|---|---|
| Complete one of the following options: | | |
| *Option One* [1] | | *12* |
| Study abroad for a semester (fall or spring) in any foreign country (except Canada) | | |
| Transfer a minimum of 12 Study Abroad credits to JHU | | |
| *Option Two* [2] | | *9* |
| Two semesters of a beginner/elementary foreign language | | |
| One cultural course [4] | | |
| *Option Three* [3] | | *9* |
| One intermediate foreign language course | | |
| Two cultural courses [4] | | |

1. The study abroad courses may satisfy any degree requirements, such as Mathematics, Natural Sciences, Fundamentals of Engineering Science, and Free Electives.
2. Students may not use their native language to satisfy the language requirement.
3. Students may use their native language to satisfy the language requirement.

[4] A course that covers the culture, economy, social structure, or politics of a country that uses this foreign language.

# CORE REQUIREMENTS

Grades of C- or higher are required to apply for FA requirements; however, grades of D or higher are required for the Core Requirements, which include Introduction to Engineering, Computer Language, Fundamentals of Engineering Science, and the Engineering Focus Area.

## INTRODUCTION TO ENGINEERING

| Code | Title | Credits |
|---|---|---|
| Complete one from the following: [1] | | |
| EN.500.101 | What Is Engineering? | 3 |
| EN.510.106 | Foundations of Materials Science & Engineering | 3 |
| EN.520.137 | First Year ECE Design | 4 |
| EN.530.107 & EN.530.108 & EN.530.111 | MechE Undergraduate Seminar I and MechE Undergraduate Seminar II and Intro to MechE Design and CAD | 3 |
| EN.540.101 | Chemical Engineering Today | 1 |
| EN.560.100 | Civilization Engineered: Structures and Systems | 3 |
| EN.570.108 | Introduction to Environmental Engineering and Design | 3 |

[1] If EN.530.107 MechE Undergraduate Seminar I is taken, EN.530.108 MechE Undergraduate Seminar II and EN.530.111 Intro to MechE Design and CAD must also be completed to fulfill the requirement.

## COMPUTER LANGUAGE

| Code | Title | Credits |
|---|---|---|
| Complete one of the following: | | |
| EN.500.112 | Gateway Computing: JAVA (FA2 Requirement) | 3 |
| EN.500.113 | Gateway Computing: Python (FA2 Requirement) | 3 |
| EN.601.220 | Intermediate Programming | 4 |

## FUNDAMENTALS OF ENGINEERING

Complete three of the four options.

| Code | Title | Credits |
|---|---|---|
| *Circuits/Electronics Option* [1] | | |
| Complete one of the following: | | |
| EN.520.230 & EN.520.231 | Mastering Electronics and Mastering Electronics Laboratory | 5 |
| EN.530.241 & EN.530.243 | Electronics & Instrumentation and Electronics and Instrumentation Laboratory | 4 |
| *Statics Option* | | |
| EN.560.201 | Statics & Mechanics of Materials | 3 |
| *Materials Science Option* | | |
| Complete one of the following: | | |
| EN.510.311 | Structure Of Materials | 3 |
| EN.530.352 | Materials Selection | 4 |
| *Thermodynamics Option* | | |
| Complete one of the following: | | |
| EN.510.312 | Thermodynamics/Materials | 3 |
| EN.530.231 | Mechanical Engineering Thermodynamics | 3 |
| EN.540.203 | Engineering Thermodynamics | 3 |

[1] Both EN.520.230 Mastering Electronics and EN.520.231 Mastering Electronics Laboratory **OR** EN.530.241 Electronics & Instrumentation and EN.530.243 Electronics and Instrumentation Laboratory must be completed if the Circuits/Electronics option is pursued.

## ENGINEERING FOCUS AREA

Six courses of at least 3 credits each (a minimum of 18 credits) that focus on a student's engineering knowledge are required. These courses must be centralized thematically or departmentally to an engineering discipline. Students are encouraged to develop their focus areas in consultation with their academic advisor.

| Code | Title | Credits |
|---|---|---|
| Three courses that are related thematically or departmentally at any level | | 9 |
| Additional three courses from the chosen theme or department that are at 300-level or higher | | 9 |

## FREE ELECTIVES

Grades of D or higher are required. Satisfactory (S) grades will be accepted.

| Code | Title | Credits |
|---|---|---|
| Elective courses as needed to reach the 120 credits required for the degree | | |