

# 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.

The distinctive features of the Bachelor of Arts in General Engineering include:

**Breadth.** Course requirements for the Bachelor of Arts in General Engineering encourage breadth. Approximately 17% of required credits are in mathematics or statistics, 12% in the natural sciences, 20% in humanities and/or social sciences, 8% in international studies (language or other) and 30% in engineering, with the rest being free electives.

**Flexibility.** This program is designed to allow students, in consultation with their advisor, the flexibility to choose a program of study which develops their interests. The engineering concentration and the humanities and social science requirements may be departmentally based or may follow a creative theme designed by the student and his/her advisor. Students are encouraged to minor in any area of their choosing.

**Interdisciplinary Study.** The distribution requirements are ideal for students who seek to understand areas at the interface between technical fields (such as robotics, nanotechnology, and biomaterials) or the connections between a technical area and a discipline in the humanities or social sciences (e.g., environment issues and international trade or ethics and biotechnology).

**International Dimensions of Engineering.** Students are required to develop some knowledge of the international dimensions of engineering. They can do this by studying abroad or by taking a combination of language and other classes which develop an understanding of the culture, technology, or society in a foreign country.

This degree is not an engineering degree and is not suitable for employment as a licensed, professional engineer. This program is **not** accredited by the Accreditation Board for Engineering and Technology (ABET). 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 2024. Students who entered JHU as degree-seeking students prior to Fall 2024 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. A maximum of 12 D credits may be counted towards degree requirements.

No Departmental Honors are granted.

## GENERAL REGULATIONS

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). Details of these requirements are as follows:

- **First-Year Seminar (minimum of 2 credits):** one course, minimum of 2 credits. Beginning academic year 2024-2025, all WSE students must successfully complete at least one discussion-based or design-based first-year seminar (FYS) course.
- **Writing Intensive (minimum of 12 credits):** four courses, minimum of 3 credits each. One course must specifically develop writing skills. These courses have to be taken for a letter grade and passed with a C- or higher, in accordance with university policy. The writing-intensive courses may be applied to any of the requirement areas above.
- **Humanities and/or Social Sciences (minimum of 21 credits):** seven courses; at least four related courses which form a core (two of which are at the advanced level), and three additional courses with area designations with H or S.
- **Mathematics (minimum of 20 credits):** five courses; two in calculus, one in statistics, one 200-level or above and one elective.
- **Natural Sciences (minimum of 15 credits):** four courses (of which at least one must be physics) and two terms of laboratory.
- **International Dimensions of Engineering (minimum of 9 credits):** Either a semester abroad or three courses which provide expertise in international issues (these may count towards the Humanities or Social Science requirement above).
- **Engineering (minimum of 33 credits):** one course which is an introduction to an engineering discipline, one course in a computer language, three fundamental engineering science courses, and six courses in an engineering concentration which are related thematically or departmentally (at least three of which must be at the advanced level).
- **Free Electives:** unrestricted courses taken to meet the 120-credit degree requirement.

## UNIVERSITY AND WSE SCHOOL 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/>).

### First-Year Seminar (FYS)

All students entering Hopkins from high school are required to complete a First-Year Seminar with a Satisfactory (S) grade in their first year of study. First-Year Seminars are offered only with the Satisfactory/Unsatisfactory grading system; they are not offered for letter grades.

Code	Title	Credits
One FYS course		2-3
<b>Total Credits</b>		<b>2-3</b>

### Writing Intensive for BA in General Engineering

A grade of C- or higher is required. No Satisfactory/Unsatisfactory grades will be accepted. Courses must be at least 3 credits each. Courses with a W designation may also be used to satisfy other requirements.

Code	Title	Credits
Three Writing Intensive (W Courses)		9
At least one courses that specifically develops writing skills. Three course options that satisfy the requirement are:		3
AS.004.101	Reintroduction to Writing	
AS.220.105	Introduction to Fiction & Poetry I	
EN.661.110	Professional Writing and Communication	
<b>Total Credits</b>		<b>12</b>

### Distribution for BA in General Engineering

Courses must be at least 3 credits each and may overlap with the Writing Intensive requirement. Elementary language courses, which do not carry an area designator, can be used to satisfy the Distribution requirement for engineering students.

Code	Title	Credits
<b>FOUR HUMANITIES (H) OR SOCIAL SCIENCES (S) FOCUS AREA</b> <sup>1</sup>		<b>12</b>
Two H or S courses at any level		
Two H or S courses at 300-level or higher		
<b>THREE HUMANITIES (H) OR SOCIAL SCIENCES (S) ELECTIVE</b> <sup>2</sup>		<b>9</b>
Three H or S courses at any level		
<b>Total Credits</b>		<b>21</b>

<sup>1</sup> H or S Focus Area must be taken as a coherent group in either the Humanities OR Social Sciences.

<sup>2</sup> H or S Electives do not need to align with the student's Focus Area.

## MAJOR REQUIREMENTS

Students are required to have a minimum cumulative Grade Point Average of 2.0 to graduate. A maximum of 12 D credits may be counted toward degree requirements.

## MATHEMATICS

Code	Title	Credits
AS.110.108	Calculus I (Physical Sciences & Engineering)	4
or AS.110.106	Calculus I (Biology and Social Sciences)	
AS.110.109	Calculus II (For Physical Sciences and Engineering)	4
or AS.110.107	Calculus II (For Biological and Social Science)	
or AS.110.113	Honors Single Variable Calculus	
One course from Math (AS.110.xxx) or Applied Math & Statistics (EN.553.xxx) department at any level		4
One course from Math (AS.110.xxx) or Applied Math & Statistics (EN.553.xxx) department at 200-level or higher		4
One course in statistics (a calculus-based statistics course is encouraged, but not required)		4
<b>Total Credits</b>		<b>20</b>

## NATURAL SCIENCES

A minimum of 15 credits are required.

Code	Title	Credits
One Physics lecture course from the following:		3-4
AS.171.101	General Physics: Physical Science Major I <sup>1</sup>	
or AS.171.11C	General Physics I for Biological Science Majors	
or AS.171.11C	Classical Mechanics I	
or AS.171.11C	General Physics for Physical Sciences Majors (AL)	
or EN.530.12	Introduction to Mechanics I	
One Natural Science lecture course from the following:		3
AS.030.101	Introductory Chemistry I	
or AS.020.115	General Biology I	
Two additional lecture courses with N area designation <sup>2</sup>		6
One laboratory course from the following:		1
AS.173.111	General Physics Laboratory I	
or AS.030.103	Introductory Chemistry Laboratory I	
or AS.020.115	General Biology Laboratory I	
One additional laboratory course with N area designation <sup>2</sup>		1
<b>Total Credits</b> <sup>1</sup>		<b>14-18</b>

<sup>1</sup> If EN.530.123 Introduction to Mechanics I is taken, an additional credit with N designation is needed to meet the 15-credit requirement.

<sup>2</sup> 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 are required to demonstrate competence in being able to address technical issues within the context of another society by completing one of the three options.

Code	Title	Credits
Complete one of the following options:		
<b>Option One</b> <sup>1</sup>		<b>12</b>
	Study abroad for a semester (fall or spring) in any foreign country (except Canada)	
	Transfer a minimum of 12 Study Abroad credits to JHU	

<i>Option Two</i> <sup>2</sup>	9
Two semesters of a beginner/elementary foreign language	
One cultural course <sup>4</sup>	
<i>Option Three</i> <sup>3</sup>	9
One intermediate foreign language course	
Two cultural courses <sup>4</sup>	
<i>Total Credits</i>	9-12

<sup>1</sup> The study abroad courses may satisfy any degree requirements, such as Mathematics, Natural Sciences, Fundamentals of Engineering Science, and Free Electives.

<sup>2</sup> Students may not use their native language to satisfy the language requirement.

<sup>3</sup> Students may use their native language to satisfy the language requirement.

<sup>4</sup> A course that covers the culture, economy, social structure, or politics of a country that uses this foreign language.

## CORE REQUIREMENTS

The 33 credits of the Core Requirements are comprised of Introduction to Engineering, Computer Language, Fundamentals of Engineering Science, and Engineering Focus Area.

### INTRODUCTION TO ENGINEERING

Code	Title	Credits
Complete one course from the following: <sup>1</sup>		3-4
EN.500.101	What Is Engineering?	
EN.510.106	Foundations of Materials Science & Engineering	
EN.520.137	First Year ECE Design	
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	
EN.560.100	Civilization Engineered	
EN.570.108	Introduction to Environmental Engineering and Design	
<i>Total Credits</i>		3-4

<sup>1</sup> 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 course from the following:		3-4
EN.500.112	Gateway Computing: JAVA	
or EN.500.111	Gateway Computing: Python	
or EN.500.111	Gateway Computing: Matlab	
EN.601.220	Intermediate Programming	
<i>Total Credits</i>		3-4

### FUNDAMENTALS OF ENGINEERING SCIENCE

Code	Title	Credits
Complete three of the four areas:		
<i>Area One: Circuits/Electronics (select one lecture and lab option)</i> <sup>1</sup>		
EN.520.230 & EN.520.231	Mastering Electronics and Mastering Electronics Laboratory	4-5

or EN.530.241 Electronics & Instrumentation & EN.530.243 and Electronics and Instrumentation Laboratory

<i>Area Two: Statics</i>		
EN.560.201	Statics & Mechanics of Materials	3
<i>Area Three: Materials Science (select one course)</i>		
EN.510.311	Structure Of Materials	3
or EN.530.352	Materials Selection	
<i>Area Four: Thermodynamics (select one course)</i>		
EN.510.312	Thermodynamics/Materials	3
or EN.530.231	Mechanical Engineering Thermodynamics	
or EN.540.203	Engineering Thermodynamics	
<i>Total Credits</i>		9-11

<sup>1</sup> 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 Area One is pursued.

### ENGINEERING FOCUS AREA

Six courses (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 with E area designation that are related thematically or departmentally at any level		9
Three courses with E area designation that are related thematically or departmentally at 300-level or higher		9
<i>Total Credits</i>		18

### FREE ELECTIVES

Code	Title	Credits
Elective courses to reach 120 credits		