

GENERAL ENGINEERING, BACHELOR OF ARTS

The Bachelor of Arts in General Engineering is a liberal arts degree that is designed to provide students with both a focus in some area of humanities or social sciences and the fundamental engineering principles needed to understand modern technology, innovations, and engineering practices. It is intended for undergraduate students who desire a background in engineering and technology yet have neither the desire nor the intention to become licensed, professional 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 or to thrive in the global industrial economy. The Bachelor of Arts in General Engineering is a true liberal arts degree with an emphasis in engineering.

This degree is not an engineering degree, and is not suitable for employment as a licensed, professional engineer. This program is not accredited by 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.

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, including mathematics, natural sciences, humanities and/or social sciences, international studies (language or other courses and experience in a foreign country), and in engineering. The curriculum also allows for many free electives.
- *Flexibility.* This program is designed to allow students, in consultation with their advisor, the flexibility to choose a program of study that matches their interests. The engineering focus area and the humanities and social science requirements may be departmentally based or may follow a 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 (for example environment issues and international trade or ethics and biotechnology).
- *International Dimensions of Engineering.* Students are required to develop knowledge of the international dimensions of engineering. They may do this by studying abroad or by taking a combination of language and other classes that develop an understanding of the culture, technology, or society in a foreign country.

Program Requirements

All undergraduate students majoring in the Bachelor of Arts in General Engineering must follow a program approved by their advisor. Candidates must fulfill the overall requirements for the bachelor's degree (<https://e-catalogue.jhu.edu/ksas-wse/undergraduate-policies/academic-policies/requirements-bachelors-degree/>) described in this catalogue. These include the university writing requirement, distribution requirement, and 120 credit minimum. Sample curricula and details on focus areas

can be found in the Advising Manual for general engineering (<https://engineering.jhu.edu/academics/general-engineering/>).

Students are required to have a minimum cumulative GPA of 2.0 to graduate. All core requirements must be taken for a letter grade while free electives may be taken as S/U grades. Further, a maximum of 12 "D" credits may be counted toward degree requirements.

No more than 12 credits completed prior to matriculation or in summer sessions at other accredited colleges or universities may be accepted. Transfer students are not subject to 12 credits of transfer credit restriction; they must obtain credit for courses they wish to transfer during their first year at Johns Hopkins. University regulations require a minimum of four consecutive full-time semesters and 60 credits earned at JHU for a Johns Hopkins degree.

Code	Title	Credits
	Mathematics	20
	Natural Sciences	15-18
	Humanities and Social Sciences *	21
	International Dimensions of Engineering	9
	Engineering Core	20-21
	Engineering Focus Area	20
	Electives (to ensure a minimum of 120 credits total)	

* *Note: the Humanities and Social Sciences requirement was updated on 10/31/2023.*

Mathematics

Mathematics is at the core of modern science and technology and a solid foundation is required to understand how contemporary engineering problems are solved. Students are required to take five courses including:

Code	Title	Credits
AS.110.108	Calculus I (Physical Sciences & Engineering)	4
or AS.110.106	Calculus I (Biological and Social Sciences)	
	Select one of the following:	4
AS.110.109	Calculus II (For Physical Sciences and Engineering)	
AS.110.107	Calculus II (For Biological and Social Science)	
AS.110.113	Honors Single Variable Calculus	
	One course in statistics	4
	One course at the 200-level or above from either the Applied Mathematics & Statistics or the Mathematics department	4
	One elective course at any level from either the Applied Mathematics & Statistics or the Mathematics department	4
	Total Credits	20

Natural Sciences

Students are required to take four courses and two laboratory courses (a minimum of 15 credits).

Code	Title	Credits
	Must take the following courses:	
AS.020.151	General Biology I	3
or AS.030.101	Introductory Chemistry I	
AS.171.101	General Physics: Physical Science Major I ¹	4

- or AS.171.103 General Physics I for Biological Science Majors
- or AS.171.105 Classical Mechanics I
- or AS.171.107 General Physics for Physical Sciences Majors (AL)

Recommended lab course:		
AS.020.153	General Biology Laboratory I	1
	or AS.030.105 Introductory Chemistry Laboratory I	
	or AS.173.111 General Physics Laboratory I	
Two additional Natural Science elective courses (area code N)		6
One additional laboratory course. ²		1-4
Total Credits		15-18

¹ EN.530.123 Introduction to Mechanics I, may be used to satisfy the Natural Sciences requirement if taken in conjunction with EN.530.124 Intro to Mechanics II.

² Integrated lab from AS.030.103 Applied Chemical Equilibrium and Reactivity w/lab may count as 1 lab.

Humanities and Social Sciences

- *Writing Requirement.* Students must complete at least four (minimum of 12 credits) writing-intensive courses (W). **At least one of the courses must specifically develop writing skills. Three courses that satisfy this requirement are: EN.661.110 Professional Writing and Communication, AS.220.105 Introduction to Fiction & Poetry I, OR AS.004.101 Reintroduction to Writing.
Note: The Writing Requirement was updated 10/31/2023.
- *Humanities or Social Science Focus.* A minimum of four courses (12 credits) must be taken as a coherent group in either the humanities or social sciences, of which two are at the advanced (300+) level.
- *Humanities or Social Science Elective.* Three additional courses (9 credits) in either the humanities or social sciences are required. These electives are typically used to take courses in economics and history of science and technology, depending on the courses chosen to fulfill the concentration requirements detailed above.

International Dimensions of Engineering

Because of the importance of the globalization of technology, all students completing the B.A. in general engineering are required to demonstrate competence in being able to address technical issues within the context of another society. This can be done in one of three different ways.

- Students may study abroad for a minimum of one fall or one spring semester in any foreign country (except Canada). In that country, they must take the equivalent of a minimum of 12 credits which are transferred to their Hopkins transcript. In this case, these credits can satisfy any degree requirements (Humanities or Social Sciences, Engineering Concentration, Mathematics, Free Electives, etc.).
- Students may complete the equivalent of two semesters of the same foreign language (students may not use language courses in their native language to satisfy this requirement) and one additional course which relates to the culture, economy, social structure, or politics of a country to which uses this foreign language (9 credits).
- Students may demonstrate proficiency in a foreign language by taking an intermediate course in a foreign language (this can include their native tongue) and two additional courses which relate to the culture, economy, social structure, or politics of a country that uses this foreign language (9 credits).

Engineering Core Introduction to Engineering

One course that is an introduction to an engineering discipline. Examples include:

Code	Title	Credits
EN.500.101	What Is Engineering?	3
EN.510.106	Foundations of Materials Science & Engineering	3
EN.520.137	Introduction To Electrical & Computer Engineering	3
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.560.100	Civilization Engineered	3
EN.570.108	Introduction to Environmental Engineering and Design	3

Computer Language

One course (at least 3 credits) in a computer language. Examples include:

Code	Title	Credits
EN.500.112	Gateway Computing: JAVA	3
EN.500.113	Gateway Computing: Python	3
EN.500.114	Gateway Computing: Matlab	3
EN.601.220	Intermediate Programming	4

Fundamentals of Engineering Science

Fulfillment of the fundamentals of engineering science requirement is successful completion of the coursework from three of the following four areas. (For Area 1: Circuits/Electronics, EN.520.230 Mastering Electronics and EN.520.231 Mastering Electronics Laboratory must be taken together. ***Note: The fundamentals of engineering science requirement was updated 10/31/2023.***

Area 1: Circuits/Electronics

Code	Title	Credits
EN.520.230 & EN.520.231	Mastering Electronics and Mastering Electronics Laboratory	5

Area 2: Statics

Code	Title	Credits
EN.560.201	Statics & Mechanics of Materials	3

Area 3: Materials Science

Code	Title	Credits
EN.510.311 or EN.530.352	Structure Of Materials Materials Selection	3

Area 4: Thermodynamics

Code	Title	Credits
EN.510.312 or EN.530.231 or EN.540.203	Thermodynamics/Materials Mechanical Engineering Thermodynamics Engineering Thermodynamics	3

Engineering Focus Area

The engineering focus area must consist of at least six courses (minimum of 18 credits) that are related thematically or departmentally; at least three (3) courses of which must be at the advanced level (300 or above). While examples of focus areas are provided in the Advising

Manual, students are encouraged to develop their own focus areas in consultation with their faculty advisor.

Free Electives

Students must complete a minimum of 120 credits in total. The number of courses required will depend on how the International Dimensions requirement is satisfied and on the courses chosen in other areas.

Students must select these courses in consultation with their advisor.

These free electives are designed to allow students to develop a curriculum of study uniquely suited to their interests.