

Bachelor of Science in Electrical Engineering

The Bachelor of Science in Electrical Engineering (BSEE) degree program is accredited by the Engineering Accreditation Commission of ABET under the General Criteria and Electrical Engineering Program Criterion.

Program Educational Objectives

Within a few years of graduation, BSEE degree program recipients are expected to do the following:

- Our graduates will be engaged as practicing professionals in a broad range of careers in industry or government or be pursuing advanced degrees in academic graduate education in engineering or a related field.
- Our graduates will function effectively as members of teams demonstrating sensitivity to professional and societal contexts, integrity and versatility.

Student Outcomes

Graduates of the BSEE program are expected to know or have the following by the time of graduation:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

BSEE Degree Requirements

To obtain the BSEE degree, students must complete a minimum of 120 units consistent with the residency and other applicable requirements of Washington University and the McKelvey School of Engineering and subject to the program requirements below. All courses below must be taken for a letter grade unless otherwise specified.

Code	Title	Units
Electrical Engineering Core Courses ¹		38
ESE 105	Introduction to Electrical and Systems Engineering	4
ESE 205	Introduction to Engineering Design	3
ESE 217	Differential Equations and Dynamical Systems Modeling in Engineering	3
ESE 2180	Linear Algebra and Component Analysis	3
ESE 2190	Vector Calculus and Dynamics of Physical Systems	3
ESE 230	Introduction to Electrical and Electronic Circuits	4
ESE 232	Introduction to Electronic Circuits	3
ESE 260	Introduction to Digital Logic and Computer Design	3
ESE 326	Probability and Statistics for Engineering	3
ESE 330	Engineering Electromagnetics Principles	3
ESE 351	Signals and Systems	3
ESE 498	Electrical Engineering Capstone Design Projects	3
Other Electrical Engineering Courses		
Electrical Engineering Electives ²		15
Electrical Engineering Laboratories ³		6
Other Engineering Courses		
CSE 131	Introduction to Computer Science ⁴	3
Engr 310	Technical Writing	3
Engr 4501	Engineering Ethics and Sustainability	1
Engineering & Science Breadth ⁵		9
Mathematics and Physical Sciences		
Math 131	Calculus I	3
Math 132	Calculus II	3
Math 233	Calculus III	3
Physics 191	Physics I	3
Physics 191L	Physics I Laboratory	1
Physics 192	Physics II	3
Physics 192L	Physics II Laboratory	1
Chem 111A	General Chemistry I ⁶	3
Chem 151	General Chemistry Laboratory I	2
Humanities and Social Sciences ⁷		18

- ¹ The BSEE degree requires a minimum of 45 units of engineering topics (typically satisfied by fulfilling EE core and elective requirements). A course carrying engineering topics units will be marked in the Course Listings with the EN:TU attribute.
- ² Requirements for the EE electives:
 - a. 15 units in electrical engineering subjects from the following list: ESE 2971, ESE 330–399, ESE 400, ESE 405, ESE 415, ESE 425, ESE 429–4971, and ESE 503–589. (Electives cannot be used to satisfy other requirements in the degree program.)
 - b. Students must take at least two courses from ESE 429, ESE 4301, ESE 431, ESE 433, ESE 436, ESE 438, ESE 441, ESE 461, ESE 471, and ESE 482.
 - c. No more than 6 units of the combined units of ESE 2971 Introduction to Research in ESE, ESE 400 Independent Study, ESE 497 Undergraduate Research, and ESE 4971 Honors Thesis Research may be applied.
 - d. No more than 3 credits of 500-level courses may be applied.
- ³ Two upper-level laboratory courses (6 units) from the following list: ESE 3301, ESE 331, ESE 4480, ESE 4481, ESE 465, and ESE 488. The selection must contain at least one course from ESE 3301, ESE 331, ESE 465, and ESE 488.
- ⁴ Students are also encouraged to take CSE 247 Data Structures and Algorithms (3 units).
- ⁵ Engineering and science breadth requirements: 9 units in engineering or science outside of electrical engineering. These units must be taken in the following areas: biomedical engineering, chemical engineering, computer science and engineering, mechanical engineering, systems science and engineering, economics, mathematics, physics, biology, chemistry, earth and planetary sciences, and pre-medicine. These units must be at the 200 level or higher and cannot be used to satisfy the Common Studies requirements or the computer science requirement. Courses in other fields can be arranged with special departmental approval. Engineering and science breadth courses may be taken on a pass/fail basis. See the McKelvey common studies page for reference.
- ⁶ Chem 111A is preferred, but Chem 105 will be allowed.
- ⁷ Humanities and social sciences courses may be taken on a pass/fail basis.

For more information about the BS in Electrical Engineering curriculum, please visit the ESE website.