Bachelor of Science in Electrical Engineering

The Bachelor of Science (BS) in Electrical Engineering prepares students for a career in electrical engineering and associated professional fields. The program provides a state-of-the-art education, research experience and project-based learning from a broad range of focus areas as well as numerous opportunities to work in interdisciplinary fields. The undergraduate electrical engineering degree provides opportunities for employment with various industries including power systems, renewable energy, communications, robotics, or any other entity requiring advanced data processing or system design.

The BS in Electrical Engineering is accredited by the Engineering Accreditation Commission of ABET (https://www.abet.org).

Licensure and/or Certification

Graduates of the Bachelor of Science in Electrical Engineering gain four years of education credit toward obtaining a Professional Engineer license in Alaska.

Please go to UAA's Authorization by State (https://www.uaa.alaska.edu/academics/office-of-academic-affairs/provost_office/uaa-state-authorization/authorization.cshtml/) website for information about licensure or certification in a state other than Alaska.

Admission Requirements

- Complete the Admission Requirements for Baccalaureate Degrees. (http://catalog.uaa.alaska.edu/academicpoliciesprocesses/admissions/undergraduate/)

Special Considerations

- BS in Electrical Engineering students must meet with their faculty advisor at least once per semester to review their academic progress and future course plan.
- Students who intend to enroll in this degree of study are strongly encouraged to complete the following content in high school with a grade of C or better: Trigonometry (1/2 year), Physics (1 year), Algebra (2 years), Chemistry (1 year), and English (3 years). Insufficient preparation may increase the number of semesters required to complete the degree.

Graduation Requirements

- Complete the General University Requirements for Baccalaureate Degrees. (http://catalog.uaa.alaska.edu/undergraduateprograms/baccalaureaterequirements/)
- Complete the General Education Requirements for Baccalaureate Degrees. (http://catalog.uaa.alaska.edu/undergraduateprograms/baccalaureaterequirements/gers/)
  - The 3 credit Tier 1 Quantitative Skills GER will be met and exceeded by the following degree requirements: MATH A251, MATH A252, and MATH A253.
  - The 7 credit Natural Science GER will be met and exceeded by the following degree requirements: CHEM A105, CHEM A105L, PHYS A211, PHYS A211L, PHYS A212, and PHYS A212L.
  - For 3 credits of Tier 2 Humanities GER choose PHIL A305.
- Complete the following major requirements with a minimum grade of C:

Code	Title	Credits
Core Courses		
CHEM A105 & A105L	General Chemistry I and General Chemistry I Laboratory	4
CSCE A201	Computer Programming I	3-4
or CSE A205	Introduction to C Programming for Engineers	
CSCE A248	Computer Organization and Assembly Language Programming	3
EE A203	Fundamentals of Electrical Engineering I	4
EE/CSCE A241	Computer Hardware Concepts	4
ES A261	Introduction to Engineering Computation	3
EE A307	Introduction to Power Systems	3
EE/ME A308	Instrumentation and Measurement	3
EE/PHYS A314	Electromagnetics	3
EE/PHYS A324	Electromagnetics II	3
EE A324L	Electromagnetics Laboratory II	1
EE A333	Electronic Devices	4
EE A353 & A353L	Circuit Theory and Circuit Theory Lab	4
EE A354	Engineering Signal Analysis	3
EE A438	Design of Electrical Engineering Systems	3
EE/ME A471	Automatic Control	3
EE A451	Digital Signal Processing	3
ENGR A151	Introduction to Engineering	1
ES A209	Statics	3
ES A210	Dynamics	3
ES A302	Engineering Data Analysis	3
ESM A450	Economic Analysis and Operations	3
MATH A251	Calculus I	4
MATH A252	Calculus II	4
MATH A253	Calculus III	4
MATH A302	Ordinary Differential Equations	3
PHIL A305	Professional Ethics	3
PHYS A211 & A211L	General Physics I and General Physics I Laboratory	4
PHYS A212 & A212L	General Physics II and General Physics II Laboratory	4
Advanced Mathematics Electives		
Select 3 credits from the following:		3

MATH A314	Linear Algebra	
MATH A371	Stochastic Processes	
MATH A407	Mathematical Statistics	
MATH A410	Introduction to Complex Analysis	
MATH A424	Advanced Engineering Mathematics: Linear Algebra and Numerical Analysis	
MATH A425	Advanced Engineering Mathematics: Partial Differential Equations and Complex Variables	
MATH A426	Numerical Analysis	
MATH A432	Partial Differential Equations	
Advanced Engineering Electives		
Complete 12 credits, including at least 6 credits of EE courses, from the following:		12
CSCE A365	Computer Networks	
CSCE A465	Computer and Network Security	
EE A407	Power Distribution	
EE A465	Telecommunications	
EE A417	Green Electrical Energy Systems	
EE A441	Integrated Circuit Design	
EE A447	Power Electronics	
EE A458	Antenna Theory	
EE A462	Communication Systems	
EE A472	Advanced Linear Systems	
EE A495	Electrical Engineering Internship	
PHYS A303	Modern Physics	
Total		**108-109**

A minimum of 129 credits is required for the degree.

Honors in Electrical Engineering

The BS in Electrical Engineering recognizes distinguished achievement by conferring programmatic honors in electrical engineering. In order to receive honors in electrical engineering, a student must meet the following requirements:

- Complete all program requirements.
- Be an active member for at least one year of both a national and an on-campus student chapter of a professional engineering society that addresses issues relevant to the engineering profession.
- Earn a GPA of 3.50 or above in the courses required for the major.
- Gain approval for, complete and present a design/research project prior to applying for graduation. The project proposal, presentation and final written report must be approved by the program faculty.

Program Student Learning Outcomes

Students graduating with a BS in Electrical Engineering will have:

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.