Bachelor of Science in Electrical Engineering

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.csh.html) website for information about licensure or certification in a state other than Alaska.

Admission Requirements

To be admitted to the electrical engineering major:

1. Complete the Application and Admission Requirements for Baccalaureate Programs (http://catalog.uaa.alaska.edu/academicpoliciesprocesses/admissions/undergraduate/) and (http://catalog.uaa.alaska.edu/academicpoliciesprocesses/admissions/undergraduate/)
2. Complete the high school preparation courses (http://catalog.uaa.alaska.edu/undergraduateprograms/coeng/electricalengineering/) with a minimum grade of C.

Academic Requirements

All prerequisites for engineering courses must be completed with a minimum grade of C, and all courses listed in the major requirements must be completed with a minimum grade of C. A student who is unable to earn the required minimum grade in any course offered by the college may attempt to earn a satisfactory grade one additional time on a space-available basis. Failure to earn the required minimum grade on the second attempt may result in removal from the program. Re-admittance requires a letter of appeal from the student requesting re-admittance with an explanation of any mitigating factors and how these factors have been addressed. Re-admittance is subject to approval by the department chair of the student’s degree program.

A student who has a semester GPA below 2.00 in the major requirements will be placed on academic warning by the program. If a student on academic warning status receives a semester GPA of at least 2.00 in the major requirements, that student will be removed from academic warning status by the program. Otherwise, if a student on academic warning status receives a semester GPA below 2.00 in the major requirements, the student will be dropped from the program and must reapply in order to continue in the program.

Academic Integrity

The program requires its students to abide by the principles of academic integrity described in the Student Code of Conduct. Should suspected cases of academic misconduct occur, these cases may be submitted to the UAA Dean of Students Office, where the assistant director of student conduct reviews all allegations of academic misconduct. At the conclusion of the review, the assistant director of student conduct issues a notification of the findings and conclusions to the reporting faculty member, department chair and dean. Should a student from the program be found responsible for a case of academic misconduct by the UAA Dean of Students Office on two separate occasions, that student will be dropped from the program. Re-admittance requires a letter of appeal from the student requesting re-admittance with an explanation of any mitigating factors and how these factors have been addressed. Re-admittance is subject to approval by the department chair of the student’s degree program.

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/). Some courses listed as major requirements may also be used to satisfy General Education Requirements (GERs).
- Complete the major requirements below with a minimum grade of C:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM A105 &amp; A105L</td>
<td>General Chemistry I and General Chemistry I Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>CSCE A201 or CSE A205</td>
<td>Computer Programming I or Introduction to C Programming for Engineers</td>
<td>3-4</td>
</tr>
<tr>
<td>CSCE A248</td>
<td>Computer Organization and Assembly Language Programming</td>
<td>3</td>
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<tr>
<td>EE A203</td>
<td>Fundamentals of Electrical Engineering I</td>
<td>4</td>
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<tr>
<td>EE/CSCE A241</td>
<td>Computer Hardware Concepts</td>
<td>4</td>
</tr>
<tr>
<td>EE A261</td>
<td>MATLAB for Electrical Engineers</td>
<td>3</td>
</tr>
<tr>
<td>EE A307</td>
<td>Introduction to Power Systems</td>
<td>3</td>
</tr>
<tr>
<td>EE/ME A308</td>
<td>Instrumentation and Measurement</td>
<td>3</td>
</tr>
<tr>
<td>EE/PHYS A314</td>
<td>Electromagnetics</td>
<td>3</td>
</tr>
<tr>
<td>EE/PHYS A324</td>
<td>Electromagnetics II</td>
<td>3</td>
</tr>
<tr>
<td>EE A324L</td>
<td>Electromagnetics Laboratory II</td>
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<tr>
<td>EE A333</td>
<td>Electronic Devices</td>
<td>4</td>
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<tr>
<td>EE A353 &amp; A353L</td>
<td>Circuit Theory and Circuit Theory Lab</td>
<td>4</td>
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<tr>
<td>EE A354</td>
<td>Engineering Signal Analysis</td>
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</tr>
<tr>
<td>EE A438</td>
<td>Design of Electrical Engineering Systems</td>
<td>3</td>
</tr>
<tr>
<td>EE A465</td>
<td>Telecommunications</td>
<td>3</td>
</tr>
<tr>
<td>EE/ME A471</td>
<td>Automatic Control</td>
<td>3</td>
</tr>
<tr>
<td>ENGR A151</td>
<td>Introduction to Engineering</td>
<td>1</td>
</tr>
<tr>
<td>ES A209</td>
<td>Statics</td>
<td>3</td>
</tr>
<tr>
<td>ES A210</td>
<td>Dynamics</td>
<td>3</td>
</tr>
</tbody>
</table>
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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  General Physics I & A211L and General Physics I Laboratory  4
PHYS A212  General Physics II & A212L and General Physics II Laboratory  4
WRTG A212  Writing and the Professions  3

Advanced Mathematics Electives
Select 3 credits from the following:

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:

CSCE A365  Computer Networks
CSCE A465  Computer and Network Security
EE A407  Power Distribution
EE A417  Green Electrical Energy Systems
EE A441  Integrated Circuit Design
EE A447  Power Electronics
EE A451  Digital Signal Processing
EE A458  Antenna Theory
EE A462  Communication Systems
EE A472  Advanced Linear Systems
EE A495  Electrical Engineering Internship
PHYS A303  Modern Physics

Total  111-112

A total of 130 credits is required for the degree, of which 42 credits must be upper-division.

Honors in Electrical Engineering

Undergraduate students in the program may be recognized for exceptional performance by earning departmental honors. The award will be noted on their university transcript. In order to receive departmental honors, a student must meet each of the following requirements.

1. Complete all program requirements.
2. 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.
3. Earn a GPA of 3.50 or above in the courses required for the major.
4. 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

It is expected that graduates from the program will have the ability to:

• Apply knowledge of mathematics, science and engineering.
• Design and conduct experiments, as well as analyze and interpret data.
• Design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
• Function on multidisciplinary teams.
• Identify, formulate and solve engineering problems.
• Demonstrate an understanding of professional and ethical responsibility.
• Communicate effectively.
• Demonstrate the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and societal context.
• Recognize the need for, and the ability to engage in, lifelong learning.
• Demonstrate knowledge of contemporary issues.
• Use the techniques, skills and modern engineering tools necessary for engineering practice.