The faculty of the Electrical and Computer Engineering Department provide a positive learning environment that enables students to pursue their goals in an innovative program that is rigorous and challenging, open and supportive. The BSEE program develops practical skills by emphasizing hands-on experience in the design, implementation, and validation of electrical systems in an environment that fosters and encourages innovation and creativity. This approach builds the foundation for the following program educational objectives.

1. Breadth: Graduates will utilize their broad education emphasizing electrical engineering to serve as the foundation for productive careers in the public or private sectors, graduate education, and lifelong learning.

2. Depth: Graduates will apply their understanding of the fundamental knowledge prerequisite for the practice of and/or advanced study in electrical engineering, including its scientific principles, rigorous analysis, and creative design. The BSEE program offers depth concentration areas in communications, computer engineering, and power and control.

3. Professional skills: Graduates will apply skills for clear communication, responsible teamwork, professional attitudes and ethics needed to succeed in the complex modern work environment.

These objectives serve the department, college and university missions by ensuring that all graduates of the BSEE program have received a high quality, contemporary education that prepares them for rewarding careers in electrical engineering.

For more information about the Electrical Engineering Program mission, goals and educational objectives, visit [http://cem.uaf.edu/ece/abet/](http://cem.uaf.edu/ece/abet/).

**Major — B.S. Degree**

**Concentrations: Communications, Computer Engineering, Power and Control**

1. Complete the general university requirements. (See page 160. As part of the core curriculum requirements, complete: MATH F251X, CHEM F105X and CHEM F106X or PHYS F213X)*

2. Complete the B.S. degree requirements. (See page 160. As part of the B.S. degree requirements, complete: MATH F252X, PHYS F211X and PHYS F212X)*

3. Complete the following program (major) requirements:*  
   EE F102—Introduction to Electrical and Computer Engineering...3  
   EE F203—Electrical Engineering Fundamentals I..................4  
   EE F204—Electrical Engineering Fundamentals II...............4  
   EE F303—Electrical Machinery.................................4  
   EE F311—Applied Engineering Electromagnetics...............3  
   EE F331—High Frequency Lab.....................................1  
   EE F333W—Physical Electronics....................................4  
   EE F334—Electrical Circuit Design..............................4  
   EE F343—Digital Systems Analysis and Design...............4  
   EE F353—Circuit Theory .........................................3  
   EE F354—Engineering Signal Analysis..........................3  
   EE F471—Fundamentals of Automatic Control.................3  
   ES F101—Introduction to Engineering.........................3  
   ES F201—Computer Techniques.................................3  
   ES F208—Mechanics................................................4  
   ESM F450—Economic Analysis and Operations................3  
   MATH F253X—Calculus III......................................3
   MATH F302—Differential Equations..........................3  
   Approved EE elective.............................................3-4  
   Approved EE design elective....................................3-4  
   Approved engineering science elective**.....................3  
   Approved mathematics elective***..............................3

5. Complete one of the following concentrations:*  

**Communications**  
Complete the following:  
EE F412—Electromagnetic Waves and Devices.................................3  
EE F432—Electromagnetics Laboratory..............................................1  
EE F461—Communication Systems..................................................4  
Approved engineering science elective**.........................................3  

**Computer Engineering**  
Complete the following:  
EE F443—Computer Engineering Analysis and Design.......................4  
EE F451—Digital Signal Processing..................................................4  
EE F461—Communication Systems..................................................4  

**Power and Control**  
Complete the following:  
EE F404—Electric Power Systems..................................................4  
EE F406—Electrical Power Engineering............................................4  
Approved engineering science elective**.........................................3  

6. Minimum credits required............................................................135  

* Students must earn a C- grade or better in each course.  
** Engineering science elective to be chosen from ES F331, ME F334, ES F341 or ES F346.  
*** Mathematics elective to be chosen from the following advanced topics: linear algebra and matrices, probability and statistics, partial differential equations, numerical analysis, advanced calculus or complex variables.  

Note: Students must plan their elective courses in consultation with their electrical engineering faculty advisor, and all elective courses must be approved by their electrical engineering faculty advisor.