

ELECTRICAL ENGINEERING, B.S.

At Saint Louis University's Parks College of Engineering, Aviation and Technology, we have developed a unique, hands-on electrical engineering program that incorporates analysis, design and development of electrical systems.

As a student in the electrical engineering program at Parks College, you will gain a solid foundation through a combination of coursework and hands-on learning. You will use the physical properties of electricity and mathematics to design systems that collect, analyze, and use information, as well as distribute and utilize electrical energy, and design the electrical systems that are at the heart of today's technology such as smartphones, tablets, internet-ready televisions, satellites and many other devices.

With easy access to a sophisticated design laboratory and other technological spaces, graduates will have the necessary skills for entry into the profession as productive and effective engineers or to pursue graduate education.

A Bachelor of Science (B.S.) in electrical engineering can also be obtained with the following options:

- Bachelor of Science (B.S.) in electrical engineering, emphasis in bioelectronics (pre-health)
- Bachelor of Science (B.S.) in electrical engineering, emphasis in bioelectronics (engineering emphasis)

The bioelectronics concentration is a joint effort between the electrical engineering and biomedical engineering programs. The course of study combines science and engineering, incorporating courses in biology, chemistry, math, biomedical engineering, electrical and electronic engineering and others.

Curriculum Overview

SLU's electrical engineering program coursework provides students with both breadth and depth in electrical engineering. The program develops in students the ability to apply knowledge of mathematics, sciences and electrical engineering to find solutions to practical problems. It ensures that graduates have an opportunity to work on multidisciplinary teams and develop effective communication skills.

In addition to a strong focus on core areas of electrical engineering, the program provides a design experience that is integrated throughout the program by introducing fundamental elements of the design process throughout student coursework. The program also includes a two-semester design sequence to provide a meaningful and significant engineering design experience that focuses on and prepares students for professional practice.

Fieldwork and Research Opportunities

SLU's B.S. degree in electrical engineering is designed to give students the tools they need to excel regardless of the industry in which they choose to work.

Electrical engineering students benefit from many internship and career opportunities. Students are encouraged and assisted in obtaining summer internships in local, national and international companies through SLU's Career Services. Undergraduate students have

opportunities to conduct research with Parks College faculty during the summer, fall and spring semesters.

The program supports many club activities that involve electrical engineering practice as part of their activities. These include IEEE, autonomous mobile robotics, cube satellite design, AUVSI autonomous flight and others. These extracurricular activities enhance the lessons learned in the classroom and help students gain invaluable experience that will prepare them for their careers after graduation.

Careers

Students who graduate from the program with the bioelectronics concentration in electrical engineering will find a wealth of career opportunities in the bioengineering industry. Examples are hospital clinical engineering, medical device manufacturing/vendors, healthcare research and design centers, and medical/university laboratories.

Students pursuing the pre-health emphasis are well prepared to enter a highly challenging and rewarding field of medicine. Bioelectronics with the pre-health emphasis provides an excellent opportunity for future medical doctors to be well versed in technological advances. It allows for much greater integration and innovation of technology in medicine, for example, the uses of MRI and CT scans.

Our graduates have found employment at companies and government agencies such as:

- Ameren
- Boeing
- Emerson Electric
- Intel
- Rockwell
- Space-X
- Tellabs
- Texas Instruments
- U.S. Air Force

Admission Requirements

Begin Your Application (<http://www.slu.edu/apply.php>)

Saint Louis University also accepts the Common Application.

Freshman

All applications are thoroughly reviewed with the highest degree of individual care and consideration to all credentials that are submitted. Solid academic performance in college preparatory coursework is a primary concern in reviewing a freshman applicant's file.

To be considered for admission to any Saint Louis University undergraduate program, applicants must be graduating from an accredited high school, have an acceptable HiSET exam score or take the General Education Development (GED) test.

Transfer

Applicants must be a graduate of an accredited high school or have an acceptable score on the GED.

Students who have attempted fewer than 24 semester credits (or 30 quarter credits) of college credit must follow the above freshmen admission requirements. Students who have completed 24 or more

semester credits (or 30 quarter credits) of college credit must submit transcripts from all previously attended college(s).

In reviewing a transfer applicant's file, the Office of Admission holistically examines the student's academic performance in college-level coursework as an indicator of the student's ability to meet the academic rigors of Saint Louis University. Where applicable, transfer students will be evaluated on any courses outlined in the continuation standards of their preferred major.

International Applicants

All admission policies and requirements for domestic students apply to international students along with the following:

- Demonstrate English Language Proficiency
- Proof of financial support must include:
 - A letter of financial support from the person(s) or sponsoring agency funding the time at Saint Louis University
 - A letter from the sponsor's bank verifying that the funds are available and will be so for the duration of study at the University
- Academic records, in English translation, of students who have undertaken postsecondary studies outside the United States must include the courses taken and/or lectures attended, practical laboratory work, the maximum and minimum grades attainable, the grades earned or the results of all end-of-term examinations, and any honors or degrees received. WES and ECE transcripts are accepted.

Additional Admission Requirements

In addition to the general admission and matriculation requirements of the University, applicants to Parks College engineering programs must meet the following requirements:

- **GPA:** Minimum cumulative 3.00 high school GPA for freshmen applicants and 2.70 college GPA for transfer applicants.
- **Coursework:** Fifteen total units of high school work are required: three or four units of English; four or more units of mathematics including algebra I and II, geometry and precalculus (Algebra II with Trigonometry is not sufficient). Students should be prepared to start the first semester freshmen year in Calculus I or higher; three or four units of science including general science, introduction to physical science, earth science, biology, physics or chemistry; two or three units of social sciences including history, psychology or sociology; and three units of electives.

Admission to Parks College of Engineering, Aviation and Technology degree programs is based on a combination of secondary school grades, college admission test scores, co-curricular activities and attempted college course work, as well as other indicators of the applicant's ability, career focus and character. This process respects the non-discrimination policy of the University and is designed to select a qualified, competent and diverse student body with high standards of scholarship and character, consistent with the mission of the University.

Scholarships and Financial Aid

There are two principal ways to help finance a Saint Louis University education:

- **Scholarships:** Scholarships are awarded based on academic achievement, service, leadership and financial need.

- **Financial Aid:** Financial aid is provided in the form of grants and loans, some of which require repayment.

For priority consideration for merit-based scholarships, apply for admission by Dec. 1 and complete a Free Application for Federal Student Aid (FAFSA) by March 1.

For information on other scholarships and financial aid, visit the student financial services office online at <https://www.slu.edu/financial-aid> (<https://www.slu.edu/financial-aid/>).

Accreditation

The aerospace engineering, biomedical engineering, civil engineering, computer engineering, electrical engineering, and mechanical engineering undergraduate curricula are accredited by the Engineering Accreditation Commission of ABET, www.abet.org (<https://www.abet.org>).

See Enrollment and Graduation Data for Electrical Engineering (<https://www.slu.edu/parks/pdfs/2018-electrical-engineering-enrollment-and-graduation-data.pdf>)

Learning Outcomes

The undergraduate electrical engineering program is accredited by the Engineering Accreditation Commission of ABET (<http://www.abet.org>) (<http://www.abet.org/>).

Program Educational Objectives

The undergraduate program is designed to meet the following specific program educational objectives

- Our graduates will have acquired advanced degrees or are engaged in advanced study in engineering, business, law, medicine or other appropriate fields.
- Our graduates will have established themselves as practicing engineers in electrical, computer or related engineering fields.
- Our graduates will be filling the technical needs of society by solving engineering problems using electrical or computer engineering principles, tools, and practices.

Student Outcomes

Student outcomes are defined by ABET as the skills that graduates will attain at the time of graduation. Student outcomes are listed below:

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

Requirements

Standard Track

| Code | Title | Credits |
|---|--|---------|
| Basic Science and Mathematics Requirements | | |
| CHEM 1110 | General Chemistry I | 4 |
| & CHEM 1115 | and General Chemistry I Laboratory | |
| PHYS 1610 | University Physics I | 4 |
| & PHYS 1620 | and University Physics I Laboratory | |
| PHYS 1630 | University Physics II | 4 |
| & PHYS 1640 | and University Physics II Laboratory | |
| MATH 1660 | Discrete Mathematics | 3 |
| MATH 1510 | Calculus I | 4 |
| MATH 1520 | Calculus II | 4 |
| MATH 2530 | Calculus III | 4 |
| MATH 3110 | Linear Algebra for Engineers | 3 |
| MATH 3550 | Differential Equations | 3 |
| ECE 3052 | Probability and Random Variables for Engineers | 3 |
| ESCI 2300 | Thermodynamics | 3 |
| Communication Skills | | |
| ENGL 1920 | Advanced Writing for Professionals | 3 |
| Computer Science | | |
| CSCI 1300 | Introduction to Object-Oriented Programming | 4 |
| Liberal Arts Requirements | | |
| PHIL 3400 | Ethics & Engineering | 3 |
| THEO 1000 | Theological Foundations | 3 |
| Cultural Diversity ¹ | | 3 |
| Humanities ¹ | | 3 |
| Social & Behavioral Science ¹ | | 3 |
| Electrical Engineering Core | | |
| ECE 1001 | Introduction to Electrical and Computer Engineering I | 1 |
| ECE 1002 | Introduction to Electrical and Computer Engineering II | 1 |
| ECE 2101 | Electrical Circuits I | 3 |
| ECE 2102 | Electrical Circuits II | 3 |
| ECE 2103 | Electrical Circuits Lab | 1 |
| ECE 2205 | Digital Design | 4 |
| & ECE 2206 | and Digital Design Lab | |
| ECE 3110 | Electric Energy Conversion | 3 |
| ECE 3225 | Microprocessors | 4 |
| & ECE 3226 | and Microprocessors Laboratory | |
| ECE 3130 | Semiconductor Devices | 3 |
| ECE 3131 | Electronic Circuit Design | 4 |
| & ECE 3132 | and Electronic Circuit Design Lab | |
| ECE 3140 | Electromagnetic Fields | 3 |
| ECE 3150 | Linear Systems | 4 |
| & ECE 3151 | and Linear Systems Lab | |
| ECE 3090 | Junior Design | 1 |
| ECE 4120 | Automatic Control Systems | 3 |
| ECE 4140 | Electromagnetic Waves | 3 |
| ECE 4160 | Communication Systems | 3 |

| | | |
|----------|---|---|
| ECE 4800 | Electrical and Computer Engineering Design I | 3 |
| ECE 4810 | Electrical and Computer Engineering Design II | 3 |

ECE Electives

Students are required to take six (6) credits from an approved list and as offered. A partial list is given below. Please check with the program for a complete list of approved electives. Electives cannot be used to satisfy other curriculum requirements.

| | | |
|----------|--|---|
| ECE 3217 | Computer Architecture and Organization | |
| ECE 4170 | Energy Technologies I | |
| ECE 4110 | Power Systems Analysis I | |
| ECE 4153 | Image Processing | |
| ECE 4226 | Mobile Robotics | |
| ECE 4132 | Analog Integrated Circuit Design | |
| ECE 4235 | Digital IC Design | |
| ECE 4141 | Radar Systems | |
| ECE 4245 | Computer Networks Design | |
| ECE 4150 | Filter Design | |
| ECE 4151 | Digital Signal Processing | 3 |
| ECE 4161 | Satellite Communication | |
| ECE 4162 | Cellular Communications | |

Open Elective

Select one 3-credit course² 3

Technical Elective

Select two 3-credit courses³ 6

Internship and Co-op

Although not required, students can elect to participate in an internship or cooperative experience before graduation.

Select from the following: 0

| | | |
|----------|--|--|
| ECE 2910 | Co-op in Electrical and Computer Engineering | |
| ECE 3910 | Co-op with Industry | |
| ECE 4910 | Co-Op with Industry | |
| ECE 2915 | Internship with Industry | |
| ECE 3915 | Internship with Industry | |
| ECE 4915 | Internship with Industry | |

Concentrations

Bioelectronics Concentration (Engineering Emphasis) (p. 4)

Bioelectronics Concentration (Pre-Health Emphasis) (p. 4)

Total Credits 126

1

Cultural Diversity, Humanities, Social and Behavioral Science must be selected from an approved list.

2

One 3-credit course satisfying another minor/major or must satisfy the requirements of a technical elective.

3

Two 3-credit courses selected from an approved list in science, mathematics, Computer Science, or engineering, at the 2000-level or higher.

Bioelectronics Concentration (Engineering Emphasis)

| Code | Title | Credits |
|---|--|---------|
| Basic Science and Mathematics Requirements | | |
| BIOL 1240 & BIOL 1245 | General Biology: Information Flow and Evolution and Principles of Biology I Laboratory | 4 |
| CHEM 1110 & CHEM 1115 | General Chemistry 1 and General Chemistry 1 Laboratory | 4 |
| CHEM 1120 & CHEM 1125 | General Chemistry 2 and General Chemistry 2 Laboratory | 4 |
| ESCI 2300 | Thermodynamics | 3 |
| PHYS 1610 & PHYS 1620 | University Physics I and University Physics I Laboratory | 4 |
| PHYS 1630 & PHYS 1640 | University Physics II and University Physics II Laboratory | 4 |
| MATH 1660 | Discrete Mathematics | 3 |
| MATH 1510 | Calculus I | 4 |
| MATH 1520 | Calculus II | 4 |
| MATH 2530 | Calculus III | 4 |
| MATH 3110 | Linear Algebra for Engineers | 3 |
| MATH 3550 | Differential Equations | 3 |
| ECE 3052 | Probability and Random Variables for Engineers | 3 |
| Written and Oral Communication | | |
| ENGL 1920 | Advanced Writing for Professionals | 3 |
| Liberal Arts Requirements | | |
| PHIL 3400 | Ethics & Engineering | 3 |
| THEO 1000 | Theological Foundations | 3 |
| Cultural Diversity ¹ | | 3 |
| Humanities ¹ | | 3 |
| Social & Behavioral Science ¹ | | 3 |
| Electrical Engineering Core | | |
| ECE 1001 | Introduction to Electrical and Computer Engineering I | 1 |
| ECE 1002 | Introduction to Electrical and Computer Engineering II | 1 |
| ECE 2101 | Electrical Circuits I | 3 |
| ECE 2102 | Electrical Circuits II | 3 |
| ECE 2103 | Electrical Circuits Lab | 1 |
| ECE 2205 & ECE 2206 | Digital Design and Digital Design Lab | 4 |
| ECE 3225 & ECE 3226 | Microprocessors and Microprocessors Laboratory | 4 |
| ECE 3130 | Semiconductor Devices | 3 |
| ECE 3131 & ECE 3132 | Electronic Circuit Design and Electronic Circuit Design Lab | 4 |
| ECE 3140 | Electromagnetic Fields | 3 |
| ECE 3150 & ECE 3151 | Linear Systems and Linear Systems Lab | 4 |
| ECE 3090 | Junior Design | 1 |
| ECE 4120 | Automatic Control Systems | 3 |
| ECE 4800 | Electrical and Computer Engineering Design I | 3 |
| ECE 4810 | Electrical and Computer Engineering Design II | 3 |
| Biomedical Engineering Core | | |
| BME 2000 | Biomedical Engineering Computing | 3 |
| BME 2200 | Applied Physiology for Engineers | 3 |

| | | |
|----------|----------------------------|---|
| BME 3150 | Biomedical Instrumentation | 3 |
| BME 4100 | Biomedical Signals | 3 |

BME or ECE Electives

Students are required to take six (6) credits from an approved list and as offered. A partial list is given below. Please check with the program for a complete list of approved electives. Electives cannot be used to satisfy other curriculum requirements.

| | | |
|----------|----------------------------------|---|
| BME 4200 | Biomechanics | |
| BME 4300 | Biotransport | |
| BME 4400 | Biomaterials | |
| BME 4410 | Tissue Engineering | |
| BME 4600 | Quantitative Physiology I | |
| BME 4150 | Brain Computer Interface | 3 |
| BME 4650 | Quantitative Physiology II | |
| BME 4980 | Independent Research | |
| ECE 4170 | Energy Technologies I | |
| ECE 4110 | Power Systems Analysis I | |
| ECE 4153 | Image Processing | |
| ECE 4226 | Mobile Robotics | |
| ECE 4132 | Analog Integrated Circuit Design | |
| ECE 4235 | Digital IC Design | |
| ECE 4141 | Radar Systems | |
| ECE 4245 | Computer Networks Design | |
| ECE 4150 | Filter Design | |
| ECE 4151 | Digital Signal Processing | |
| ECE 4161 | Satellite Communication | |
| ECE 4162 | Cellular Communications | |

Internship and Co-op

Although not required, students can elect to participate in an internship or cooperative experience before graduation.

| | | |
|----------------------------|--|---|
| Select from the following: | | 0 |
| ECE 2910 | Co-op in Electrical and Computer Engineering | |
| ECE 3910 | Co-op with Industry | |
| ECE 4910 | Co-Op with Industry | |
| ECE 2915 | Internship with Industry | |
| ECE 3915 | Internship with Industry | |
| ECE 4915 | Internship with Industry | |

Total Credits **127**

¹

Cultural Diversity, Humanities, Social and Behavioral Science must be selected from an approved list.

Bioelectronics Concentration (Pre-Health Emphasis)

| Code | Title | Credits |
|---|---|---------|
| Basic Science and Mathematics Requirements | | |
| BIOL 1240 & BIOL 1245 | General Biology: Information Flow and Evolution and Principles of Biology I Laboratory | 4 |
| BIOL 1260 & BIOL 1265 | General Biology: Transformations of Energy and Matter and Principles of Biology II Laboratory | 4 |
| CHEM 1110 & CHEM 1115 | General Chemistry 1 and General Chemistry 1 Laboratory | 4 |

| | | |
|--------------------------|---|---|
| CHEM 1120 & CHEM 1125 | General Chemistry 2 and General Chemistry 2 Laboratory | 4 |
| CHEM 2410 & CHEM 2415 | Organic Chemistry 1 and Organic Chemistry 1 Laboratory | 4 |
| CHEM 2420 & CHEM 2425 | Organic Chemistry 2 and Organic Chemistry 2 Laboratory | 4 |
| CHEM 3600 | Principles of Biochemistry | 3 |
| PHYS 1610 & PHYS 1620 | University Physics I and University Physics I Laboratory | 4 |
| PHYS 1630 & PHYS 1640 | University Physics II and University Physics II Laboratory | 4 |
| MATH 1660 | Discrete Mathematics | 3 |
| MATH 1510 | Calculus I | 4 |
| MATH 1520 | Calculus II | 4 |
| MATH 2530 | Calculus III | 4 |
| MATH 3550 | Differential Equations | 3 |
| ECE 3052 | Probability and Random Variables for Engineers | 3 |

Written and Oral Communication

| | | |
|-----------|--|---|
| ENGL 1900 | Advanced Strategies of Rhetoric and Research | 3 |
|-----------|--|---|

Liberal Arts Requirements

| | | |
|---------------------------------|--|---|
| PHIL 3400 | Ethics & Engineering | 3 |
| THEO 1000 | Theological Foundations | 3 |
| Cultural Diversity ¹ | | 3 |
| Humanities | English Literature Elective ¹ | 3 |
| PSY 1010 | General Psychology | 3 |
| SOC 1100 | Introduction to Sociology | 3 |

Electrical Engineering Core

| | | |
|------------------------|--|---|
| ECE 1001 | Introduction to Electrical and Computer Engineering I | 1 |
| ECE 1002 | Introduction to Electrical and Computer Engineering II | 1 |
| ECE 2101 | Electrical Circuits I | 3 |
| ECE 2102 | Electrical Circuits II | 3 |
| ECE 2103 | Electrical Circuits Lab | 1 |
| ECE 2205 & ECE 2206 | Digital Design and Digital Design Lab | 4 |
| ECE 3225 & ECE 3226 | Microprocessors and Microprocessors Laboratory | 4 |
| ECE 3130 | Semiconductor Devices | 3 |
| ECE 3131 & ECE 3132 | Electronic Circuit Design and Electronic Circuit Design Lab | 4 |
| ECE 3140 | Electromagnetic Fields | 3 |
| ECE 3150 & ECE 3151 | Linear Systems and Linear Systems Lab | 4 |
| ECE 3090 | Junior Design | 1 |
| ECE 4120 | Automatic Control Systems | 3 |
| ECE 4800 | Electrical and Computer Engineering Design I | 3 |
| ECE 4810 | Electrical and Computer Engineering Design II | 3 |

Biomedical Engineering Core

| | | |
|----------|----------------------------------|---|
| BME 2000 | Biomedical Engineering Computing | 3 |
| BME 2200 | Applied Physiology for Engineers | 3 |

BME or ECE Electives

Students are required to take six (6) credits from an approved list and as offered. A partial list is given below. Please check with the program for a complete list of approved electives. Electives cannot be used to satisfy other curriculum requirements.

| | | |
|----------|-----------------------------|---|
| BME 3150 | Biomedical Instrumentation | 6 |
| BME 4100 | Biomedical Signals | |
| BME 4200 | Biomechanics | |
| BME 4300 | Biotransport | |
| BME 4400 | Biomaterials | |
| BME 4410 | Tissue Engineering | |
| BME 4600 | Quantitative Physiology I | |
| BME 4650 | Quantitative Physiology II | |
| BME 4980 | Independent Research | |
| ECE 3110 | Electric Energy Conversion | |
| ECE 4225 | Hardware/Software Co-Design | |
| ECE 4226 | Mobile Robotics | |
| ECE 4235 | Digital IC Design | |

Total Credits **130**

1

Cultural Diversity and Humanities must be selected from an approved list, ensuring one of these satisfies the English Literature elective requirement.

Continuation Standards

Students must maintain a minimum 2.00 GPA

Roadmap

Roadmaps are recommended semester-by-semester plans of study for programs and assume full-time enrollment unless otherwise noted.

Courses and milestones designated as critical (marked with !) must be completed in the semester listed to ensure a timely graduation. Transfer credit may change the roadmap.

This roadmap should not be used in the place of regular academic advising appointments. All students are encouraged to meet with their advisor/mentor each semester. Requirements, course availability and sequencing are subject to change.

| Course | Title | Credits |
|--------------------------|---|-----------|
| Year One | | |
| Fall | | |
| ECE 1001 | Introduction to Electrical and Computer Engineering I | 1 |
| CHEM 1110 & CHEM 1115 | General Chemistry 1 and General Chemistry 1 Laboratory | 4 |
| ENGL 1920 | Advanced Writing for Professionals ¹ | 3 |
| MATH 1510 | Calculus I | 4 |
| THEO 1000 | Theological Foundations | 3 |
| Credits | | 15 |
| Spring | | |
| ECE 1002 | Introduction to Electrical and Computer Engineering II | 1 |
| CSCI 1300 | Introduction to Object-Oriented Programming | 4 |
| MATH 1660 | Discrete Mathematics | 3 |

| | | |
|----------------------------|---|---|
| MATH 1520 | Calculus II | 4 |
| ! PHYS 1610 & PHYS 1620 | University Physics I and University Physics I Laboratory | 4 |

Credits **16**

Year Two**Fall**

| | | |
|--------------------------|---|---|
| ECE 2101 | Electrical Circuits I | 3 |
| ECE 2205 & ECE 2206 | Digital Design and Digital Design Lab | 4 |
| MATH 2530 | Calculus III | 4 |
| PHYS 1630 & PHYS 1640 | University Physics II and University Physics II Laboratory | 4 |

Credits **15**

Spring

| | | |
|--|---|---|
| ! ECE 2102 & ECE 2103 | Electrical Circuits II and Electrical Circuits Lab | 4 |
| MATH 3110 | Linear Algebra for Engineers | 3 |
| MATH 3550 | Differential Equations | 3 |
| ESCI 2300 | Thermodynamics | 3 |
| Core: Social & Behavioral Science ² | | 3 |

Credits **16**

Year Three**Fall**

| | | |
|--------------------------|--|---|
| ECE 3110 | Electric Energy Conversion | 3 |
| ECE 3225 & ECE 3226 | Microprocessors and Microprocessors Laboratory ³ | 4 |
| ECE 3226 | Microprocessors Laboratory | 1 |
| ECE 3130 | Semiconductor Devices | 3 |
| ! ECE 3150 & ECE 3151 | Linear Systems and Linear Systems Lab ³ | 4 |
| ECE 3151 | Linear Systems Lab | 1 |
| PHIL 3400 | Ethics & Engineering | 3 |

Credits **19**

Spring

| | | |
|------------------------|---|---|
| ECE 3052 | Probability and Random Variables for Engineers ³ | 3 |
| ECE 3131 & ECE 3132 | Electronic Circuit Design and Electronic Circuit Design Lab | 4 |
| ECE 3132 | Electronic Circuit Design Lab | 1 |
| ECE 3090 | Junior Design | 1 |
| ECE 4120 | Automatic Control Systems | 3 |
| ECE 3140 | Electromagnetic Fields | 3 |
| ECE 4160 | Communication Systems (ECE 3150, ECE 3052 or Open Elective) ⁹ | 3 |

Credits **18**

Year Four**Fall**

| | | |
|-------------------------------|--|---|
| ECE 4800 | Electrical and Computer Engineering Design I ⁵ | 3 |
| CORE: HUMANITIES ² | | 3 |
| ECE 4140 | Electromagnetic Waves | 3 |
| ECE Elective ⁶ | | 3 |

| | | |
|---------------------------------|--|---|
| Technical Elective ⁷ | | 3 |
|---------------------------------|--|---|

Credits **15**

Spring

| | | |
|---------------------------------------|---|---|
| ECE 4810 | Electrical and Computer Engineering Design II | 3 |
| Core: Humanities ⁸ | | 3 |
| ECE 4160 | Communication Systems (ECE 3150, ECE 3052 or Open Elective) ⁹ | 3 |
| Core: Cultural Diversity ⁸ | | 3 |
| ECE Elective ⁶ | | 3 |
| Technical Elective ⁷ | | 3 |

Credits **18**

Total Credits **132**

1

Students needing prerequisite work in writing skills as determined by ACT or SAT scores will be required to take ENGL 1500 The Process of Composition (3 cr)

2

Must be taken from a list of approved courses in Social and Behavioral Science including Economics

3

Prerequisite requirement of computer programming, either CSCI 1060 Introduction to Computer Science: Scientific Programming (3 cr), CSCI 1300 Introduction to Object-Oriented Programming (4 cr), or BME 2000 Biomedical Engineering Computing (3 cr)

4

Courses satisfying another major or minor, or a course satisfying the technical elective requirement

5

Requires senior standing (all required technical courses through the junior year have been completed and passed)

6

Must be taken from the approved list of ECE elective courses

7

Must be selected from courses in science, math, computer science, or engineering at the 2000 level or higher.

8

Cannot be used to satisfy another core requirement

9

ECE 4160 Communications is only taught every other year.