BACHELOR OF SCIENCE IN ELECTRICAL AND COMPUTER ENGINEERING (BSECE) DEGREE

The program leading to the BSECE degree is accredited by the Engineering Accreditation Commission (EAC) of ABET, https://www.abet.org (https://www.abet.org/).

Program Learning Outcomes (Student Outcomes) for the BSECE Degree

Upon completing the BSECE degree, students will be able to demonstrate:

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.

Program Educational Objectives for the BSECE Degree

The Bachelor of Science in Electrical and Computer Engineering's (BSECE) degree program strives to provide a high quality degree that emphasizes fundamental principles, responds to the changing demands and opportunities of technology, challenges the exceptional abilities of Rice students, and prepares these students for roles of leadership in their chosen careers. In support of this goal, the Bachelor of Science in Electrical and Computer Engineering's (BSECE) degree Program Educational Objectives (PEOs) are to produce graduates who:

1. Practice electrical and computer engineering, and related fields, and/or obtain an advanced degree in electrical and computer engineering, and related fields.
2. Use mathematical modeling and problem solving skills in electrical and computer engineering and other technical applications.
3. Analyze, incorporate, and adapt to new technical and scientific developments.
4. Assume increasing professional responsibility and enhance communication and teamwork abilities.

Requirements for the BSECE Degree

For general university requirements, see Graduation Requirements (https://ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements/). Students pursuing the BSECE degree must complete:

- A minimum of 28-30 courses (82-83 credit hours), depending on course selection, to satisfy major requirements.
- A minimum of 125 credit hours to satisfy degree requirements.
- A minimum of 13 courses (39 credit hours) taken at the 300-level or above.
- The requirements for one area of specialization (see below for areas of specialization). When students declare the major (https://ga.rice.edu/undergraduate-students/academic-opportunities/majors-minors-certificates/#text) in Electrical and Computer Engineering (associated with the BSECE degree), students must additionally identify and declare one of four areas of specialization, either in:
  - Computer Engineering (p. 3): provides a broad background in computer systems engineering, including computer architecture, digital hardware engineering, software engineering, and computer systems performance analysis, ***or***
  - Data Science/Systems (p. 4): integrates the foundations, tools and techniques involving data acquisition, data analytics, data storage and computing infrastructure in order to enable meaningful extraction of actionable information from diverse and potentially massive data sources. Applications include wireless communication systems, digital signal processing, image processing, and networking, ***or***
  - Neuroengineering (p. 4): exploits engineering techniques to understand, repair, manipulate, or treat the diseases of human neural systems and networks, ***or***
  - Photonics, Electronics, and Nano-devices (p. 4): encompasses studies of electronic materials, including nanomaterials, semiconductor and optoelectronic devices, lasers and their applications.

Because of the common core requirements, it is possible for students to change their area of specialization at any time, even after initially declaring the major. To do so, please contact the Office of the Registrar (registrar@rice.edu).

The specialization electives provide the flexibility to create a focus that crosses traditional areas. Ultimately each student's program must contain a course sequence that provides depth in one area and courses from at least two areas to provide breadth. Because of the number of options, students should consult early with departmental advisors to plan a program that meets their needs. Planning sheets and degree plan forms can be found on the Electrical and Computer Engineering (http://www.ece.rice.edu/) website.

The BSECE degree is the usual degree taken by those students planning a career in engineering practice. The BSECE requires more hours and greater depth than the BA degree; however, it still provides considerable flexibility and can reduce the time required to become a licensed professional engineer. In the final year, BSECE students undertake a capstone design project.

Students considering a major offered by the Electrical and Computer Engineering department should take physics (PHYS 101, PHYS 102) and calculus (MATH 101 or MATH 105, MATH 102 or MATH 106) in their first year, along with COMP 140. The first core courses in the department,

ELEC 220, ELEC 241 (lecture) with ELEC 240 (lab), and ELEC 261 are usually taken during the second year, along with more math and science. A course can satisfy only one program requirement. Students entering with advanced placement may have more scheduling options and may take some of these core courses in their first year. Students who place out of required courses without transcript credit must substitute other approved courses in the same area. Students should consult with one of the department's undergraduate advisors in these situations.

The courses listed below satisfy the requirements for this major. In certain instances, courses not on this official list may be substituted upon approval of the major's academic advisor, or where applicable, the department's Director of Undergraduate Studies. (Course substitutions must be formally applied and entered into Degree Works by the major's Official Certifier (https://registrar.rice.edu/facstaff/degreeworks/officialcertifier/).) Students and their academic advisors should identify and clearly document the courses to be taken.

Summary

Code	Title	Credit Hours
Total Credit Hours Required for the Major in Electrical and Computer Engineering		82-83
Total Credit Hours Required for the BSECE Degree		125

Degree Requirements

Code	Title	Credit Hours
Core Requirements		
Mathematics and Science Courses		
ELEC 261	INTRODUCTION TO PHYSICAL ELECTRONICS I	3
ELEC 263	INTRODUCTION TO PHYSICAL ELECTRONICS LAB	1
ELEC 303	RANDOM SIGNALS IN ELECTRICAL ENGINEERING SYSTEMS	3
MATH 101	SINGLE VARIABLE CALCULUS I	3
or MATH 105	AP/OTH CREDIT IN CALCULUS I	
MATH 102	SINGLE VARIABLE CALCULUS II	3
or MATH 106	AP/OTH CREDIT IN CALCULUS II	
MATH 212	MULTIVARIABLE CALCULUS	3
or MATH 221	HONORS CALCULUS III	
Select 1 course from the following:		*3*
CAAM 334	MATRIX ANALYSIS FOR DATA SCIENCE	
CAAM 335	MATRIX ANALYSIS	
MATH 354	HONORS LINEAR ALGEBRA	
MATH 355	LINEAR ALGEBRA	
Select 1 from the following:		*4*
PHYS 101 & PHYS 103	MECHANICS (WITH LAB) and MECHANICS DISCUSSION [1]	
PHYS 111	HONORS MECHANICS (WITH LAB) [1]	
Select 1 from the following:		*4*
PHYS 102 & PHYS 104	ELECTRICITY & MAGNETISM (WITH LAB) and ELECTRICITY AND MAGNETISM DISCUSSION [1]	
PHYS 112	HONORS ELECTRICITY & MAGNETISM (WITH LAB) [1]	
Approved Electives in Mathematics and Science		
Select 3-4 credit hours from the following typically approved courses:		*3-4*
BIOS 201	INTRODUCTORY BIOLOGY I	
CAAM 336	DIFFERENTIAL EQUATIONS IN SCIENCE AND ENGINEERING	
CAAM 378	INTRODUCTION TO OPERATIONS RESEARCH AND OPTIMIZATION	
CHEM 121	GENERAL CHEMISTRY I	
or CHEM 111	AP/OTH CREDIT IN GENERAL CHEMISTRY I	
CHEM 122	GENERAL CHEMISTRY II	
or CHEM 112	AP/OTH CREDIT IN GENERAL CHEMISTRY II	
CHEM 123	GENERAL CHEMISTRY LABORATORY I	
or CHEM 113	AP/OTH CREDIT IN GENERAL CHEMISTRY LAB I	
CHEM 124	GENERAL CHEMISTRY LABORATORY II	
or CHEM 114	AP/OTH CREDIT IN GENERAL CHEMISTRY LAB II	
MATH 211	ORDINARY DIFFERENTIAL EQUATIONS AND LINEAR ALGEBRA	
MATH 222	HONORS CALCULUS IV	
Electrical and Computer Engineering (ECE) Core Courses:		
ELEC 220	FUNDAMENTALS OF COMPUTER ENGINEERING	4
ELEC 241 & ELEC 240	FUNDAMENTALS OF ELECTRICAL ENGINEERING I and FUNDAMENTALS OF ELECTRICAL ENGINEERING I LABORATORY	4
ELEC 242 & ELEC 244	SIGNALS, SYSTEMS, AND TRANSFORMS and ANALOG CIRCUITS LABORATORY	4
ELEC 301	SIGNALS, SYSTEMS, AND LEARNING	3
ELEC 305	INTRODUCTION TO PHYSICAL ELECTRONICS II	3
ELEC 326 / COMP 326	DIGITAL LOGIC DESIGN	3
Computation Course		
COMP 140	COMPUTATIONAL THINKING	4
or COMP 130	ELEMENTS OF ALGORITHMS AND COMPUTATION	
Design Requirements [2]		
Design Laboratory [3]		3
ELEC 327	IMPLEMENTATION OF DIGITAL SYSTEMS	
ELEC 332	ELECTRONIC SYSTEMS PRINCIPLES AND PRACTICE	
ELEC 364	PHOTONICS MEASUREMENTS: PRINCIPLES AND PRACTICE	
Design [4]		
ELEC 494	SENIOR DESIGN (2 semesters required, 1st semester)	3
ELEC 494	SENIOR DESIGN (2 semesters required, 2nd semester)	3
Area of Specialization		
Select 1 from the following Areas of Specialization (see Areas of Specialization below):		*18*
Computer Engineering		
Data Science / Systems		
Neuroengineering		
Photonics, Electronics, and Nano-devices		

Total Credit Hours Required for the Major in Electrical and Computer Engineering	**82-83**
Additional Credit Hours to Complete Degree Requirements *	11-12
University Graduation Requirements (https://ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements/) *	31
Total Credit Hours	**125**

Footnotes and Additional Information

* **Note:** University Graduation Requirements include 31 credit hours, comprised of Distribution Requirements (Groups I, II, and III), FWIS, and LPAP coursework. In some instances, courses satisfying FWIS or distribution requirements may additionally meet other requirements, such as the Analyzing Diversity (AD) requirement, or some of the student's declared major, minor, or certificate requirements. Additional Credit Hours to Complete Degree Requirements include general electives, coursework completed as upper-level, residency (hours taken at Rice), and/or any other additional academic program requirements.

1 The Electrical and Computer Engineering department has determined that credit awarded for PHYS 141 *CONCEPTS IN PHYSICS I* and credit awarded for PHYS 142 *CONCEPTS IN PHYSICS II* are not eligible for meeting the requirements of the Electrical and Computer Engineering major.

2 The design requirements (Design Laboratory and Senior Design) are typically taken during the junior and senior years.

3 Design Laboratory is typically taken in the junior year. The required Design Laboratory does not count as a specialization course. It is important to consult a departmental advisor when choosing the Design Laboratory course or if interested in taking a second one. Any Design Laboratory course taken above the one required course will count as a General Elective, not as a specialization course.

4 Students must complete the ELEC 494 during both the fall and spring semesters of their senior year. Within the senior design sequence, professional issues and project management for electrical engineers provide instruction in professional engineering topics and the nontechnical aspects of the design process, including ethics, design methodology, project planning, technical presentations, and documentation. Both semesters of the senior year are devoted to the team design project using the resources of the Oshman Engineering Design Kitchen (OEDK) through the ELEC 494 course. In the fall semester of the senior year, students finalize their project topics in coordination with the faculty and begin the design project. In the spring semester, students continue in the laboratory to complete their design project. Several presentations and design contests within the ECE department and the School of Engineering occur in the spring in which to showcase the projects.

Areas of Specialization

Students must complete the requirements as listed for one of the following areas of specialization as offered by the BSECE degree program. A total of 6 courses (minimum of 18 credit hours) must be taken from at least two areas of specialization, including a minimum of 3 courses from one area of specialization, 1 course from an area of specialization ***outside*** of the student's chosen specialization, and 2 courses from ***any*** area of specialization. In addition, ELEC graduate coursework at the 500-level may be used to satisfy specialization area requirements with permission. Consult departmental advisors and the Electrical and Computer Engineering (https://www.ece.rice.edu/) website for the latest information.

Area of Specialization: Computer Engineering

To fulfill the remaining BSECE degree requirements, students pursuing the Computer Engineering area of specialization must complete:

- a minimum of 3 courses (9 credit hours) from the Computer Engineering area of specialization
- 1 course (3 credit hours) from any area of specialization ***outside*** Computer Engineering (from Data Science/Systems, Neuroengineering, or Photonics, Electronics, and Nano-devices)
- 2 courses (6 credit hours) from ***any*** area of specialization (including Computer Engineering)

Code	Title	Credit Hours
Select a minimum of 3 courses from the following: [1]		*9*
COMP 321	INTRODUCTION TO COMPUTER SYSTEMS	
COMP 382	REASONING ABOUT ALGORITHMS	
COMP 430	INTRODUCTION TO DATABASE SYSTEMS	
ELEC 323 / COMP 322	PRINCIPLES OF PARALLEL PROGRAMMING	
ELEC 410 / COMP 436	SECURE AND CLOUD COMPUTING	
ELEC 411	MICROWAVE ENGINEERING	
ELEC 414	WIRELESS INTEGRATED CIRCUITS AND SYSTEMS	
ELEC 421 / COMP 421	OPERATING SYSTEMS AND CONCURRENT PROGRAMMING	
ELEC 422	VLSI SYSTEMS DESIGN	
ELEC 423	DIGITAL INTEGRATED CIRCUITS	
ELEC 424 / COMP 424	MOBILE AND EMBEDDED SYSTEM DESIGN AND APPLICATION	
ELEC 425 / COMP 425	COMPUTER SYSTEMS ARCHITECTURE	
ELEC 426	ADVANCED DIGITAL INTEGRATED CIRCUITS DESIGN	
ELEC 429 / COMP 429	INTRODUCTION TO COMPUTER NETWORKS	
ELEC 434	ADVANCED HIGH-SPEED SYSTEM DESIGN	
ELEC 437	INTRODUCTION TO COMMUNICATION NETWORKS	
ELEC 442	INTRODUCTION TO ANALOG INTEGRATED CIRCUITS	
ELEC 450 / COMP 450 / MECH 450	ALGORITHMIC ROBOTICS	
Select 1 course from any Area of Specialization outside Computer Engineering (from Data Science/Systems, Neuroengineering, or Photonics, Electronics, and Nano-devices)		*3*
Select 2 courses from any Area of Specialization (including Computer Engineering)		*6*
Total Credit Hours		**18**

Footnotes and Additional Information

[1] The sequence of COMP 140, COMP 182, and COMP 215 is recommended in addition for the Computer Engineering area of specialization as these courses are prerequisites for many of the Computer Science courses.

Area of Specialization: Data Science/Systems

To fulfill the remaining BSECE degree requirements, students pursuing the Data Science/Systems area of specialization must complete:

- a minimum of 3 courses (9 credit hours) from the Data Science/Systems area of specialization
- 1 course (3 credit hours) from any area of specialization ***outside*** Data Science/Systems (from Computer Engineering, Neuroengineering, or Photonics, Electronics, and Nano-devices)
- 2 courses (6 credit hours) from ***any*** area of specialization (including Data Science/Systems)

Code	Title	Credit Hours
Select a minimum of 3 courses from the following:		*9*
COMP 330	TOOLS AND MODELS FOR DATA SCIENCE	
DSCI 302	INTRODUCTION TO DATA SCIENCE TOOLS AND MODELS	
DSCI 303	MACHINE LEARNING FOR DATA SCIENCE	
ELEC 406	LINEAR ALGEBRA FOR DATA SCIENCE	
ELEC 430	MODERN COMMUNICATION THEORY AND PRACTICE	
ELEC 431	DIGITAL SIGNAL PROCESSING	
ELEC 432	MOBILE BIO-BEHAVIORAL SENSING	
ELEC 433	ARCHITECTURE FOR WIRELESS COMMUNICATIONS	
ELEC 434	ADVANCED HIGH-SPEED SYSTEM DESIGN	
ELEC 435 / MECH 435	INTRODUCTION TO ENERGY-EFFICIENT MECHATRONICS	
ELEC 436 / MECH 420	FUNDAMENTALS OF CONTROL SYSTEMS	
ELEC 437	INTRODUCTION TO COMMUNICATION NETWORKS	
ELEC 439	DATA SCIENCE AND DYNAMICAL SYSTEMS	
ELEC 440 / COMP 440	ARTIFICIAL INTELLIGENCE	
ELEC 441	COMPUTATIONAL IMAGING	
ELEC 445	INTRODUCTION TO DIGITAL IMAGE AND VIDEO PROCESSING	
ELEC 447 / COMP 447	INTRODUCTION TO COMPUTER VISION	
ELEC 475	LEARNING FROM SENSOR DATA	
ELEC 478	INTRODUCTION TO MACHINE LEARNING	
ELEC 498 / COMP 498 / MECH 498	INTRODUCTION TO ROBOTICS	
MECH 488	DESIGN OF MECHATRONIC SYSTEMS	
STAT 413	INTRODUCTION TO STATISTICAL MACHINE LEARNING	
Select 1 course from any Area of Specialization outside Data Science/Systems (from Computer Engineering, Neuroengineering, or Photonics, Electronics, and Nano-devices)		*3*
Select 2 courses from any Area of Specialization (including Data Science/Systems)		*6*
Total Credit Hours		**18**

Area of Specialization: Neuroengineering

To fulfill the remaining BSECE degree requirements, students pursuing the Neuroengineering area of specialization must complete:

- a minimum of 3 courses (9 credit hours) from the Neuroengineering area of specialization
- 1 course (3 credit hours) from any area of specialization ***outside*** Neuroengineering (from Computer Engineering, Data Science/Systems, or Photonics, Electronics, and Nano-devices)
- 2 courses (6 credit hours) from ***any*** area of specialization (including Neuroengineering)

Code	Title	Credit Hours
Select a minimum of 3 courses from the following:		*9*
ELEC 380 / BIOE 380 / NEUR 383	INTRODUCTION TO NEUROENGINEERING: MEASURING AND MANIPULATING NEURAL ACTIVITY	
ELEC 382 / NEUR 382	INTRODUCTION TO COMPUTATIONAL NEUROSCIENCE	
ELEC 483	MACHINE LEARNING AND SIGNAL PROCESSING FOR NEURO ENGINEERING	
ELEC 485 / BIOE 485 / COMP 485	FUNDAMENTALS OF MEDICAL IMAGING I	
ELEC 486 / BIOE 486 / COMP 486	FUNDAMENTALS OF MEDICAL IMAGING II	
ELEC 487	IMAGING OPTICS	
ELEC 488 / CAAM 415 / NEUR 415	THEORETICAL NEUROSCIENCE: FROM CELLS TO LEARNING SYSTEMS	
ELEC 489 / CAAM 416 / NEUR 416	NEURAL COMPUTATION	
Select 1 course from any Area of Specialization outside Neuroengineering (from Computer Engineering, Data Science/Systems, or Photonics, Electronics, and Nano-devices)		*3*
Select 2 courses from any Area of Specialization (including Neuroengineering)		*6*
Total Credit Hours		**18**

Area of Specialization: Photonics, Electronics, and Nano-devices

To fulfill the remaining BSECE degree requirements, students pursuing the Photonics, Electronics, and Nano-devices area of specialization must complete:

- a minimum of 3 courses (9 credit hours) from the Photonics, Electronics, and Nano-devices area of specialization
- 1 course (3 credit hours) from any area of specialization ***outside*** Photonics, Electronics, and Nano-devices (from Computer Engineering, Data Science/Systems, or Neuroengineering)

- 2 courses (6 credit hours) from ***any*** area of specialization (including Photonics, Electronics, and Nano-devices)

Code	Title	Credit Hours
Select a minimum of 3 courses from the following:		*9*
ELEC 262	INTRODUCTION TO WAVES AND PHOTONICS	
ELEC 361	QUANTUM MECHANICS FOR ENGINEERS	
or PHYS 311	INTRODUCTION TO QUANTUM PHYSICS I	
ELEC 460	PHYSICS OF SENSOR MATERIALS AND NANOSENSOR TECHNOLOGY	
ELEC 461	SOLID STATE PHYSICS	
or PHYS 412	SOLID STATE PHYSICS	
ELEC 462	OPTOELECTRONIC DEVICES	
PHYS 302	INTERMEDIATE ELECTRODYNAMICS	
PHYS 416	COMPUTATIONAL PHYSICS	
Select 1 course from any Area of Specialization outside Photonics, Electronics, and Nano-devices (from Computer Engineering, Data Science/Systems, or Neuroengineering)		*3*
Select 2 courses from any Area of Specialization (including Photonics, Electronics, and Nano-devices)		*6*
Total Credit Hours		**18**

Policies for the BSECE Degree

Advising

Rice University provides multiple avenues for undergraduate advising through the Office of Academic Advising, the Rice Residential College system, and academic departments. Although students may consult with their Divisional Advisors in their College during the first and second years, they are welcome and encouraged to meet with a major advisor in the Electrical and Computer Engineering Department. In particular, ECE students are required to meet with a major advisor in ECE at least during their junior and senior years to discuss their ECE Area of Specialization course selection and Design Courses. The ECE Undergraduate Committee currently has five faculty members who serve as major advisors.

Program Restrictions and Exclusions

Students pursuing the BSECE Degree should be aware of the following program restriction:

- As noted in Majors, Minors, and Certificates (https://ga.rice.edu/undergraduate-students/academic-opportunities/majors-minors-certificates/), under *Declaring Majors, Minors and Certificates*, students may not obtain both a BA and a BS in the same major. Students pursuing the Bachelor of Science in Electrical and Computer Engineering (BSECE) Degree may not additionally pursue the BA Degree with a Major in Electrical and Computer Engineering.

Transfer Credit

For Rice University's policy regarding transfer credit, see Transfer Credit (https://ga.rice.edu/undergraduate-students/academic-policies-procedures/transfer-credit/). Some departments and programs have additional restrictions on transfer credit. The Office of Academic Advising maintains the university's official list of transfer credit advisors (https://oaa.rice.edu/advising-network/transfer-credit-advisors/) on their website: https://oaa.rice.edu. Students are encouraged to meet with their academic program's transfer credit advisor when considering transfer credit possibilities.

Departmental Transfer Credit Guidelines

Students pursuing the BSECE degree should be aware of the following departmental transfer credit guidelines:

- Requests for transfer credit will be considered by the program director (and/or the program's official transfer credit advisor) on an individual case-by-case basis.

Additional Information

For additional information, please see the Electrical and Computer Engineering website: https://www.ece.rice.edu/.

Opportunities for the BSECE Degree

Academic Honors

The university recognizes academic excellence achieved over an undergraduate's academic history at Rice. For information on university honors, please see Latin Honors (https://ga.rice.edu/undergraduate-students/honors-distinctions/university/) (*summa cum laude*, *magna cum laude*, and *cum laude*) and Distinction in Research and Creative Work (https://ga.rice.edu/undergraduate-students/honors-distinctions/university/). Some departments have department-specific Honors awards or designations.

Fifth-Year Master's Degree Option for Rice Undergraduate Students

In certain situations and with some terminal master's degree programs, Rice students have an option to pursue a master's degree by adding an additional fifth year to their four years of undergraduate studies.

Advanced Rice undergraduate students in good academic standing typically apply to the master's degree program during their junior or senior year. Upon acceptance, depending on course load, financial aid status, and other variables, they may then start taking some required courses of the master's degree program. A plan of study will need to be approved by the student's undergraduate major advisor and the master's degree program director.

As part of this option and opportunity, Rice undergraduate students:

- must complete the requirements for a bachelor's degree and the master's degree independently of each other (i.e. no course may be counted toward the fulfillment of both degrees).
- should be aware there could be financial aid implications if the conversion of undergraduate coursework to that of graduate level reduces their earned undergraduate credit for any semester below that of full-time status (12 credit hours).
- more information on this *Undergraduate - Graduate Concurrent Enrollment* opportunity, including specific information on the registration process can be found here (https://ga.rice.edu/undergraduate-students/academic-opportunities/undergraduate-graduate-concurrent-enrollment/).

Rice undergraduate students completing studies in science and engineering may have the option to pursue the Master of Electrical and Computer Engineering (MECE) degree. For additional information, students should contact their undergraduate major advisor and the MECE program director.

Independent Research

The ECE Department encourages our undergraduates to pursue research projects with the faculty. The ECE Department has several opportunities including the multi-year, team-oriented Vertically Integrated Projects (VIP) program through the ELEC 491 course and individual independent research with a faculty member through the ELEC 490 course. For information on taking an undergraduate summer research course tuition free, see the *Summer Sessions* tab on the Office of the Registrar website (https://registrar.rice.edu/students/summersessions/). Also, there are often summer research opportunities through the NSF funded Research Experience for Undergraduates (REU) program, through individual ECE faculty grants, or through the Smalley-Curl Institute REU Sites program.

Study Abroad

A semester of study abroad is a valuable experience to enhance an individual's perspective on engineering and technology. The ECE Department encourages students to explore this option particularly for the spring semester of the sophomore or junior year. The ECE Department and the University Study Abroad office coordinate to review programs and courses appropriate for Rice engineering students.

Additional Information

For additional information, please see the Electrical and Computer Engineering website: https://www.ece.rice.edu/.