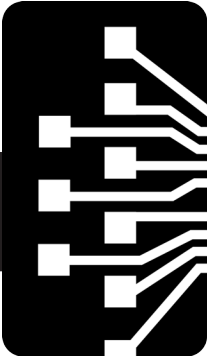


# ELEC

## Electrical and Computer Engineering

<b>WEB LINKS</b>	<a href="http://ece.rice.edu/">http://ece.rice.edu/</a>
<b>FRANK ADVICE</b>	Start with MATH, CHEM, PHYS, and COMP requirements to get a solid background. Some of the sophomore core ELEC courses may be taken freshman year, such as ELEC 220, but often ELEC 241, 242, and 261 are best taken in the sophomore year. See the ECE department undergraduate web page and the IEEE student branch freshman handbook at <a href="http://ieee.rice.edu/">http://ieee.rice.edu/</a> for additional sample degree plans.
<b>ADVICE FOR STUDENTS WITH AP CREDIT</b>	ELEC 220, ELEC 241, ELEC 242, and ELEC 261 are introductory core courses. Many students take ELEC 261 or ELEC 220 in freshman year, but depending on one's math background, ELEC 241, ELEC 242 may be better taken in the sophomore year, depending on one's math background.
<b>ALTERNATIVE CURRICULA</b>	ECE has five specialization areas: computer engineering (CE), data science; neuroengineering; photonics, electronics and nanodevices (PEN); and systems. CE focuses on hardware design within computer systems, covering computer architecture, security and storage. Data science seeks to extract meaningful, actionable information from diverse data sources. Neuroengineering seeks to understand and manipulate neural networks, as well as treat diseases and disorders. PEN seeks to more fully understand the interaction of light and matter and apply that knowledge to develop novel devices and technologies. Systems focuses on wireless communications, digital signal processing, computer vision and networking.
<b>BS VERSUS BA</b>	ECE offers the traditional B.S.E.E. degree for students interested in engineering careers. Only the program leading to the B.S.E.E. is accredited by the Engineering Accreditation Commission (EAC) of ABET, <a href="http://www.abet.org">www.abet.org</a> . The B.A. degree program allows more flexibility for careers in finance, law or medicine.
<b>NOT REQUIRED BUT HIGHLY RECOMMENDED COURSES</b>	ELEC 262 Introduction to Waves and Photonics ELEC 342 Analog Electronic Circuits ELEC 345 Introduction to Computer Vision



<p><b>RESEARCH</b></p>	<p>There are many opportunities for undergraduate independent and team research in ECE, including ELEC 490: Undergraduate Research Projects. Several faculty have started the Large Scale Integrated Projects program (VIP) open to freshmen. Summer research opportunities are available through Research Experiences for Undergraduates (REU). Contact faculty directly for more information. ECE has a Corporate Affiliates program (<a href="http://ecead.rice.edu">ecead.rice.edu</a>), and encourages students to attend the annual event held in spring to meet informally with member companies.</p>
<p><b>INTERNSHIPS AND STUDY ABROAD</b></p>	<p>There are many opportunities in electrical and computer engineering for study abroad and international internships, including through the Nakatani RIES program. See <a href="http://nakatani-ries.rice.edu">nakatani-ries.rice.edu</a></p>
<p><b>PROFESSIONAL ORGANIZATIONS</b></p>	<p>The Institute for Electrical and Electronics Engineers (IEEE) has an active student chapter and an Eta Kappa Nu honor society at Rice. See <a href="http://ieee.rice.edu">ieee.rice.edu</a> for details on the Friday lunch talk schedule and the annual laboratory open house. The IEEE student chapter co-presidents for 2017-2018 are Yoseph Maguire (<a href="mailto:yoseph.d.maguire@rice.edu">yoseph.d.maguire@rice.edu</a>) and Anika Zaman (<a href="mailto:anika.zaman@rice.edu">anika.zaman@rice.edu</a>). Also, the ECE Department has an active colloquium series, with many events co-sponsored by IEEE Houston chapters chaired by ECE faculty.</p>
<p><b>INTERESTING COURSES FOR NON-MAJORS</b></p>	<p>ELEC 220 Fundamentals of Computer Engineering  ELEC 243 Electronic Measurement Systems  ELEC 261 Electronic Materials and Quantum Devices</p>

# B.A. In Electrical Engineering

Specializations: Computer engineering  
 Data science  
 Neuroengineering  
 Photonics, electronics, and nano-devices  
 Systems: communications, control, networks and signal processing

## Sample Degree Plan

THIS IS ONE EXAMPLE OF MANY POSSIBLE SCHEDULES.  
 CONSULT A DIVISIONAL OR DEPARTMENTAL ADVISER TO CUSTOMIZE YOUR DEGREE PLAN.

FALL			SPRING		
<b>FRESHMAN</b> 15 credits			<b>FRESHMAN</b> 17 credits		
COMP 140	Computational Thinking	4**	ELEC 220	Fund of Computer Engineering	4*
MATH 101	Single Variable Calculus I	3	MATH 102	Single Variable Calculus II	3
PHYS 101•	Mechanics w/Lab	4*	PHYS 102••	Electricity & Magnetism w/Lab	4*
FWIS	Freshman Writing	3	DIST	Distribution elective	3
LPAP	Lifetime Phys Activity elective	1	OPEN	Open elective	3
<b>SOPHOMORE</b> 14 credits			<b>SOPHOMORE</b> 16 credits		
ELEC 240	Fund of Electrical Engr I Lab	1	CAAM 335	Matrix Analysis	3
ELEC 241	Fund of Electrical Engineering I	3*	or MATH 355		
ELEC 261	Electronic Mat & Quantum Devices	3	ELEC 242	Fund of Electrical Engineering II	3*
DIST	Distribution elective	3	ELEC 244	Fund of Electrical Engr II Lab	1
OPEN	Open elective	4	MATH 212	Multivariable Calculus	3
			DIST	Distribution elective	3
			OPEN	Open elective	3
<b>JUNIOR</b> 15 credits			<b>JUNIOR</b> 15 credits		
ELEC 303	Random Signals	3	ELEC 305	Intro to Physical Electronics	3
ELEC 326	Digital Logic Design	3*	ELEC	ECE Design Lab elective	3
DIST	Distribution elective	3	DIST	Distribution elective	3
OPEN	Open elective	3	OPEN	Open elective	3
SPEC	ECE specialization elective	3	OPEN	Open elective	3
<b>SENIOR</b> 16 credits			<b>SENIOR</b> 15 credits		
SPEC	ECE specialization elective	3	SPEC	ECE specialization elective	3
SPEC	ECE specialization elective	3	DIST	Distribution elective	3
DIST	Distribution elective	3	OPEN	Open elective	3
OPEN	Open elective	4	OPEN	Open elective	3
OPEN	Open elective	3	OPEN	Open elective	3

\* In addition to class hours, these courses have a regularly scheduled lab and/or discussion session that must fit into your schedule.

\*\* Comp 140 in the fall followed by COMP 182 in the spring of freshman year is strongly recommended for Computer Engineering

- When registering for PHYS 101, you must also register for PHYS 103, the discussion section for 101.
- When registering for PHYS 102, you must also register for PHYS 104, the discussion section for 102.

BASIC REQUIREMENTS	General math & science courses	26
	Core courses in major	25
ELECTIVE REQUIREMENTS	Engineering specialization electives	12
	Open electives and LPAP	39
	FWIS and distribution courses	21
Minimum credit required for the B.A.		123

Of the 123 total degree credits, the B.A. in Electrical Engineering requires at least 63 credits in general math and science courses, core courses including design lab and specialization electives.

## Major Requirements

NUMBER	CREDIT	TITLE
COMP 140**	4*	Computational Thinking
ELEC 327/332/364	3	ECE Design Lab elective
ELEC 220	4*	Fundamentals of Computer Engineering
ELEC 240	1	Fundamentals of Electrical Engineering I Lab
ELEC 241	3*	Fundamentals of Electrical Engineering I
ELEC 242	3*	Fundamentals of Electrical Engineering II
ELEC 244	1	Fundamentals of Electrical Engineering II Lab
ELEC 261	3	Electronic Materials & Quantum Devices
ELEC 303	3	Random Signals
ELEC 305	3	Introduction to Physical Electronics
ELEC 326	3*	Digital Logic Design
MATH 101	3	Single Variable Calculus I
MATH 102	3	Single Variable Calculus II
MATH 212	3	Multivariable Calculus
MATH 355/CAAM 335	3	Linear Algebra or Matrix Analysis
PHYS 101•/111	4*	Mechanics w/Lab
PHYS 102••/112	4*	Electricity and Magnetism w/Lab
SPEC	3–4	Specialization elective
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\* In addition to class hours, these courses have a regularly scheduled lab and/or discussion session that must fit into your schedule.

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- When registering for PHYS 102, you must also register for PHYS 104, the discussion section for 102.