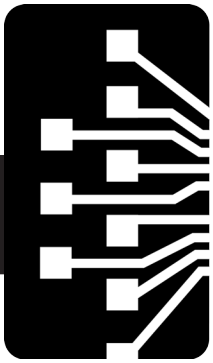
ELEC

Electrical and Computer Engineering

WEB LINKS	http://ece.rice.edu/
FRANK ADVICE	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 http://ieee.rice.edu/ for additional sample degree plans.
ADVICE FOR STUDENTS WITH AP CREDIT	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.
ALTERNATIVE CURRICULA	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.
BS VERSUS BA	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, www.abet.org. The B.A. degree program allows more flexibility for careers in finance, law or medicine.
NOT REQUIRED BUT HIGHLY RECOMMENDED COURSES	ELEC 262 Introduction to Waves and Photonics ELEC 342 Analog Electronic Circuits ELEC 345 Introduction to Computer Vision



RESEARCH	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 (ecead.rice.edu), and encourages students to attend the annual event held in spring to meet informally with member companies.
INTERNSHIPS AND STUDY ABROAD	There are many opportunities in electrical and computer engineering for study abroad and international internships, including through the Nakatani RIES program. See nakatani-ries.rice.edu
PROFESSIONAL ORGANIZATIONS	The Institute for Electrical and Electronics Engineers (IEEE) has an active student chapter and an Eta Kappa Nu honor society at Rice. See ieee.rice.edu 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 (yoseph.d.maguire@rice.edu) and Anika Zaman (anika.zaman@rice.edu). Also, the ECE Department has an active colloquium series, with many events co-sponsored by IEEE Houston chapters chaired by ECE faculty.
INTERESTING COURSES FOR NON–MAJORS	ELEC 220 Fundamentals of Computer Engineering ELEC 243 Electronic Measurement Systems ELEC 261 Electronic Materials and Quantum Devices

B.S. 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

FRESHMAN		18 credits
CHEM 121	General Chemistry I w/Lab	4*
COMP 140	Computational Thinking**	4*
MATH 101	Single Variable Calculus I	3
PHYS 101•	Mechanics w/Lab	4*
FWIS	Freshman Writing	3

SOPHOMORE		16 credits
ELEC 240	Fund of Elec Engr I Lab	1
ELEC 241	Fund of Elec Engineering I	3*
ELEC 261	Electronic Mat & Quantum Devices	3
MATH 212	Multivariable Calculus	3
DIST	Distribution elective	3
OPEN	Open Elective	3

JUNIOR		16 credits
ELEC 301	Introduction to Signals	3
ELEC 303	Random Signals	3
ELEC 326	Digital Logic Design	3*
OPEN	Open elective	3
OPEN	Open elective	3
LPAP	Lifetime Phys Activity elective	1

SENIOR		18 credits
ELEC 494	ECE Senior Design	3
SPEC	ECE specialization elective	3
SPEC	ECE specialization elective	3
DIST	Distribution elective	3
OPEN	Open elective	3
OPEN	Open elective	3

SPRING

FRESHMAN		17 credits
ELEC 220	Fund of Computer Engineering	4*
MATH 102	Single Variable Calculus II	3
PHYS 102••	Electricity & Magnetism w/Lab	4*
DIST	Distribution elective	3
OPEN	Open Elective	3

SOPHOMORE		16 credits
CAAM 335 or MATH 355	Matrix Analysis	3
ELEC 242	Fund of Electrical Engineering II	3*
ELEC 244	Fund of Electrical Engr II Lab	1
ELEC 305	Intro to Physical Electronics	3
ELEC	ECE math and science elective	3
DIST	Distribution elective	3

JUNIOR		18 credits
ELEC	ECE Design Lab elective	3
SPEC	Specialization elective	3
SPEC	Specialization elective	3
DIST	Distribution elective	3
OPEN	Open elective	3
OPEN	Open elective	3

SENIOR		15 credits
ELEC 494	ECE Senior Design	3
SPEC	ECE specialization elective	3
SPEC	ECE specialization elective	3
DIST	Distribution 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	33
	Core courses in major	34
ELECTIVE REQUIREMENTS	Engineering specialization electives	18–24
	Open electives and LPAP	22–28
	FWIS and distribution courses	21
	Minimum credit required for the B.S.	134

Of the 134 total degree credits, the B.S. in Electrical Engineering requires at least 85 credits in general math and science courses, core courses including the design lab and senior design, and specialization electives.

Major Requirements

NUMBER	CREDIT	TITLE
CHEM 121	4*	General Chemistry I w/Lab
COMP 140**	4*	Computational Thinking/Intro to Engineering Computation
ELEC	3	ECE Math and Science elective
ELEC 220	4*	Fundamentals of Computer Engineering
ELEC 241	4*	Fundamentals of Electrical Engineering I
ELEC 242	4*	Fundamentals of Electrical Engineering II
ELEC 261 or PHYS 202	3	Electronic Materials & Quantum Devices/Modern Physics
ELEC 301	3	Introduction to Signals
ELEC 303	3	Random Signals
ELEC 305	3	Introduction to Physical Electronics
ELEC 326	3*	Digital Logic Design
ELEC 494 (x2)	4	Senior Design
ELEC 327/332/364	3	ECE Design Lab elective
MATH 101	3	Single Variable Calculus I
MATH 102	3	Single Variable Calculus II
MATH 212 or 221	3	Multivariable Calculus/Honors Calculus III
MATH 355/CAAM 335	3–4	Linear Algebra or Matrix Analysis
PHYS 101•/111	3*	Mechanics w/Lab
PHYS 102••/112	4*	Electricity and Magnetism w/Lab
SPEC	3–4	ECE Specialization elective
SPEC	3–4	ECE Specialization elective
SPEC	3–4	ECE Specialization elective
SPEC	3–4	ECE Specialization elective
SPEC	3–4	ECE Specialization elective
SPEC	3–4	ECE Specialization elective

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