

Degree Type – Bachelor of Science Electrical Engineering (BSEE)**Degree Title – Electrical Engineering**

Electrical engineering is a broad field with applications in almost all areas of industry including computer systems, control systems, telecommunications, semiconductors, electronics, and electric power. The Department of Electrical Engineering offers a Bachelor of Science in Electrical Engineering (BSEE) degree that is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).

This degree provides a broad, solid education in engineering fundamentals as well as the opportunity for in-depth study in specialized topics. Students completing the program will have rigorous foundation for engineering practice in industry as well as for graduate studies in engineering and other disciplines. The program has well-equipped, accessible laboratories and extensive computing facilities.

STUDENT LEARNING OUTCOMES:

1. Be able to use knowledge of mathematics, basic sciences and engineering to analyze (identify, formulate, and solve) problems in electrical engineering.
2. Be able to design and conduct experiments and interpret the results.
3. Be able to design electrical and electronic devices, systems, or processes that meet given specifications.
4. Be able to function in multi-disciplinary teams.
5. Be able to communicate ideas effectively in graphical, oral, and in written media.
6. Understand the professional responsibility of an engineer and how engineering solutions impact safety, economics, ethics, politics, and societal and cultural issues.
7. Understand the need for life long learning to keep abreast of current practice.
8. Be able to use state of the art computational hardware and software for analysis, design, and documentation (techniques, skills, and modern engineering tools necessary for engineering practice).
9. Demonstrate a knowledge of mathematics and basic sciences necessary for the analysis and design of electrical and electronic circuits and systems.
10. Demonstrate an understanding of the principles of electrical circuits and electronics, and analysis, synthesis, and experimental techniques for both analog and digital electronic circuits.
11. Demonstrate an understanding of the applications of electrical engineering principles in systems for communications, controls, and computation, and power.
12. Demonstrate an ability to create and use software both as an analysis and design tool, and as part of systems containing hardware and software.
13. Demonstrate depth of knowledge beyond the basic level in one or more specific electrical engineering topics elected by the student.
14. Demonstrate the ability to use their engineering and project management knowledge to successfully complete design projects of substantial complexity.

A – GENERAL EDUCATION CORE – 42 HOURS

Students must fulfill the General Education Core requirements. The courses listed below satisfy both degree requirements and General Education Core requirements.

Required**Mathematics – 3 hours**

MATH 2413 Calculus I (or MATH 2487 Honors) three-hour lecture

Life and Physical Science – 6 hours

PHYS 2425 Physics for Scientists and Engineers I three-hour lecture

PHYS 2426 Physics for Scientists and Engineers II three-hour lecture

Language, Philosophy, and Culture – 3 hours

PHIL 1310 Ethics, Happiness, and the Good Life (Must be Engineering/Computer Science section)

Integrative and Experiential Learning – 6 hours

Choose any course from Humanities, except PHIL, and choose one:

CSCI 1380 Computer Science I

CSCI 1370 Engineering Computer Science I (or CSCI 1378 Honors)

B – MAJOR REQUIREMENTS – 60 HOURS (48 advanced)**1 – Electrical Engineering Core – 45 hours (33 advanced)**

ELEE 1101 Introduction to Electrical Engineering

ELEE 2319 Numerical Computation and Data Visualization

ELEE 2330 Digital Systems Engineering I

ELEE 2130 Digital Systems Lab

ELEE 2305 Electrical Circuits I

ELEE 2105 Electrical Circuits Lab

ELEE 3321 Signals and Systems

ELEE 3301 Electronics I

ELEE 3101 Electronics I Lab

ELEE 3225 Electrical Engineering Lab I

ELEE 3230 Electrical Engineering Lab II

ELEE 3302 Electronics II

ELEE 3315 Electromagnetics Engineering

ELEE 3435 Microprocessor Systems

ELEE 4303 Digital Systems Engineering II

ELEE 4321 Automatic Control Systems

ELEE 4351 Communication Theory

ELEE 4328 Solid State Electronic Devices

2 – Senior Design – 6 hours (6 advanced)

ELEE 4361 Senior Design I

ELEE 4362 Senior Design II

3 – Technical Electives – 9 hours (9 advanced)

Choose from:

ELEE 3300 Engineering Coop/Internship

ELEE 3331 Embedded Systems

ELEE 3370 Power Electronics

ELEE 3371 Electrical Power Systems

ELEE 4323 Rapid Control Prototyping

ELEE 4325 Introduction to Robotics

ELEE 4333 Topics in Electrical Engineering

ELEE 4360 High Frequency Engineering

ELEE 4364 Antennas and Propagation

ELEE 4365 Digital Signal Processing

ELEE 4366 Image Processing

ELEE 4367 Fiber Optic Communications

ELEE 4368 Electrokinetics in Microsystems

ELEE 4372 Electrical Machinery and Power System Fundamentals

ELEE 4373 Renewable Energy

ELEE 4375 Introduction to VLSI Design

ELEE 4380 Computer Architecture
ELEE 4390 Communications Networks

C – SUPPORT COURSES – 23 HOURS (6 advanced)

1 – Physics Lab – 2 hours

PHYS 2425 Physics for Scientists and Engineers I one-hour lab
PHYS 2426 Physics for Scientists and Engineers II one-hour lab

2 – Basic Science or Engineering Electives – 3 hours

Choose from:

CHEM 1307 Chemistry for Engineers
CHEM 1311 General Chemistry I
MECE 2301 Statics

3 – Mathematics – 18 hours (6 advanced)

ELEE 3340 Probability and Statistics for Electrical Engineers
MATH 2346 Mathematics for Electrical and Computer Engineers
MATH 2413 Calculus I (or MATH 2487 Honors) one-hour lecture
MATH 2414 Calculus II (or MATH 2488 Honors)
MATH 2415 Calculus III
MATH 3341 Differential Equations

TOTAL CREDIT HOURS FOR GRADUATION – 125 HOURS

TOTAL ADVANCED HOURS – 54 HOURS

ADMISSION, PROGRESSION, AND GRADUATION REQUIREMENTS, if applicable:

Graduation requirements

In addition to the graduation requirements listed in the UTRGV 2015-2017 Undergraduate Catalog, demonstration of proficiency in a language other than English is required at the undergraduate level equivalent to a minimum of six credit hours. Proficiency can be demonstrated by a college credit exam, a placement test approved through the UTRGV Department of Writing and Language Studies, and/or up to six credit hours of college-level language coursework.