

Degree Type – Bachelor of Science in Engineering Physics (BS)**Degree Title – Engineering Physics**

The Engineering Physics Program offers the Bachelor of Science in Engineering Physics. Engineering Physics program covers a broad field with applications in most of engineering areas to meet student demand as well as regional, national, and international needs. The program seeks to improve the human condition through the education of skilled engineers to succeed and lead in industry, government, and commerce, and through development and establishment of internationally recognized research. A spectrum of programs will provide a palette of engineering skills, by educating a broad base of engineering applicants to the various engineering tracks.

With this degree, students will be eligible for a variety of positions in engineering, technology, sciences and graduate school in many disciplines including engineering, science, business, and medicine. Graduates of this program are also qualified to be high school math and science teachers with a short alternative certification program for which scholarships are available. Engineering Physics Program is accredited by the Engineering Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012.

STUDENT LEARNING OUTCOMES:

1. An ability to apply knowledge of mathematics, science, and engineering
2. An ability to design and conduct experiments, as well as to analyze and interpret data
3. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
4. An ability to function on multi-disciplinary teams
5. An ability to identify, formulate, and solve engineering problems
6. An understanding of professional and ethical responsibility
7. An ability to communicate effectively
8. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
9. A recognition of the need for, and an ability to engage in, life-long learning
10. A knowledge of contemporary issues
11. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

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 Sciences – 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 (Must be Engineering section)

Integrative and Experiential Learning – 6 hours

CHEM 1111 General Chemistry I Lab

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

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

CSCI 1380 Computer Science I (or CSCI 1387 Honors)

B – MAJOR REQUIREMENTS – 86 HOURS MINIMUM (44 advanced minimum)**1 – Engineering Physics Core – 56 hours (27 advanced)****a – Engineering Core – 35 hours (18 advanced)**

ENGR 1201 Introduction to Engineering
 ENGR 1206 Introduction to Engineering Design
 ENGR 2105 Linear Circuits Lab
 ENGR 2301 Engineering Mechanics I: Statics
 ENGR 2302 Engineering Mechanics II: Dynamics
 ENGR 2305 Linear Circuits
 ENGR 2308 Engineering Economics
 ENGR 3121 Electronics I Lab
 ENGR 3303 Engineering Thermodynamics
 ENGR 3304 Mechanics of Materials
 ENGR 3321 Electronics I
 ENGR 4242 Senior Design Project I
 ENGR 4243 Senior Design Project II
 ENGR 4441 Control Systems

b – Physics Core – 6 hours (6 advanced)

PHYS 3311 Mathematical Methods in Physics I

Choose one:

CSCI 3350 Numerical Methods
 MATH 3343 Introduction to Mathematical Software
 PHYS 4390 Computational Methods for Engineers and Scientists

c – Mathematics Support Courses – 12 hours (3 advanced)

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

d – Chemistry Support Course – 3 hours

CHEM 1311 General Chemistry I

2– Engineering Concentrations – 30 hours minimum (17 advanced minimum)**a – Bioengineering – 34 hours (18 advanced)**

BENG 4120 Molecular Bioengineering Lab
 BENG 4320 Molecular Bioengineering
 BIOL 1406 General Biology I (or BIOL 1487 Honors)
 BIOL 1407 General Biology II (or BIOL 1488 Honors)
 CHEM 1112 General Chemistry II Lab
 CHEM 1312 General Chemistry II
 CHEM 2123 Organic Chemistry I Lab
 CHEM 2323 Organic Chemistry I
 ENGR 4406 Engineering Mechanics III: Fluid Mechanics
 PHYS 3315 Physics of Biological Systems
 PHYS 3402 Modern Physics
 PHYS 4315 Analysis of Biomolecules by Physical Methods

b – Computer Engineering – 31 hours (21 advanced)

CSCI 2333 Computer Organization and Assembly Language
 CSCI 2380 Computer Science II

CSCI 3310 Discrete Data Structures
 CSCI 3326 Object Oriented Programming in JAVA
 CSCI 3333 Algorithms and Data Structures
 CSCI 3334 Systems Programming
 CSCI 4310 Design and Analysis of Algorithms
 CSCI 4335 Computer Architecture
 ENGR 2130 Digital Systems I Lab
 ENGR 2330 Digital Systems I
 MATH 3331 Applied Statistics I

c – Electrical Engineering – 30 hours (20 advanced)

i – Electrical Engineering – 24 hours (20 advanced)

ENGR 2130 Digital Systems I Lab
 ENGR 2330 Digital Systems I
 ENGR 3330 Linear Signals and Systems
 ENGR 4322 Electronics II
 ENGR 4423 High Frequency Engineering
 ENGR 4326 Power Electronics
 ENGR 4425 Analog and Digital Communications
Choose one:

ENGR 3327 Engineering Electromagnetics
 PHYS 3301 Electromagnetic Theory I

ii – Electrical Engineering Electives – 6 hours

Courses must be approved by engineering advisor.

d – Mechanical Engineering Track – 30 hours (17 advanced)

i – Mechanical Engineering Core – 24 hours (17 advanced)

ENGR 1304 Engineering Graphics I
 ENGR 2340 Engineering Materials
 ENGR 2140 Engineering Materials Lab
 ENGR 4309 Mechanical Subsystem Design
 ENGR 4310 Heat and Mass Transfer
 ENGR 4406 Engineering Mechanics III: Fluid Mechanics
 ENGR 4407 Manufacturing Process Technologies
Choose one:

ENGR 3327 Engineering Electromagnetics
 PHYS 3301 Electromagnetic Theory I
 PHYS 3305 Classical Mechanics

ii – Mechanical Engineering Electives – 6 hours

Courses must be approved by engineering advisor.

TOTAL CREDIT HOURS FOR GRADUATION (MINIMUM) – 128 HOURS

TOTAL ADVANCED HOURS (MINIMUM) – 44 HOURS

ADMISSION, PROGRESSION, AND GRADUATION REQUIREMENTS, if applicable:

Admission requirements

Completion of ENGR 2301 with a minimum grade of 'C'.

Progression requirements

To begin ENGR 4242, students must pass the Upper Division Engineering Exam, after which the program will submit documentation to the Office of the Registrar.

Graduation requirements

1. A grade of 'C' or better is required in MATH 2413 (or MATH 2487 honors), MATH 2414 (or MATH 2488 Honors), MATH 2415, ENGR 2301, ENGR 2305, ENGR 2105, and a composite GPA of 2.2 or better is required in all major coursework.
2. 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.