

Degree Type – Bachelor of Science (BS)
Degree Title – Physics

A Physicist has a solid understanding of fundamental laws, which in turn can be applied to a wide area of scientific and engineering fields. It is an exciting career that requires discipline and significant amount of work. It also requires development of mathematical, experimental, theoretical, and computational skills. As a result of the Physicist's solid and broad background, Physicists can apply to a wide range of job opportunities, including National Laboratories and Research Centers, Industry, and Academia.

STUDENT LEARNING OUTCOMES:

1. To develop a solid foundation in Physics.
2. To apply mathematical knowledge to analysis of Physical systems.
3. To apply experimental knowledge to the study of Physical systems.
4. To apply computational and numerical knowledge to the modeling of Physical systems.
5. To develop oral and written communications skills used by Physicists.
6. To develop team skills geared towards contributing to multidisciplinary research.
7. To develop a clear understanding of how Physics has evolved to its current form.
8. To have a clear knowledge of current major issues and problems that Physics is facing today.

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

Integrative and Experiential Learning – 6 hours

CSCI 1380 Computer Science I (or CSCI 1387 Honors)

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

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

B – MAJOR REQUIREMENTS – 79 HOURS MINIMUM (58 advanced minimum)

1 – Physics Core Courses – 23 hours (23 advanced)

PHYS 3303 Thermodynamics

PHYS 3402 Modern Physics

PHYS 3305 Classical Mechanics

PHYS 3311 Math Methods in Physics I

PHYS 3404 Optics

PHYS 3301 Electromagnetic Theory I

PHYS 4303 Quantum Mechanics I

2 – Capstone Course(s) – 2 hours (2 advanced)

Choose one:

PHYS 4101 Laboratory Research (Repeated once)

PHYS 4201 Advanced Physics Lab

3 – Mathematics – 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

4 – Concentration – 42 hours minimum (30 advanced minimum)

Choose one concentration:

a – Pure and Applied Physics – 42 hours (30 advanced)

i – Required courses – 9 hours (9 advanced)

PHYS 4305 Statistical Mechanics

PHYS 4304 Quantum Mechanics II

PHYS 3302 Electromagnetic Theory II

ii – Physics Electives – 12 hours (12 advanced)

Choose any advanced Physics.

iii – Minor – 18 hours (9 advanced)

iv – Electives – 3 hours

b – Medical Physics – 42 hours (30 advanced)

i – Required courses – 21 hours (21 advanced)

PHYS 4305 Statistical Mechanics

PHYS 4304 Quantum Mechanics II

PHYS 3302 Electromagnetic Theory II

PHYS 3306 Introduction to Biophysics

PHYS 3310 Radiation Biophysics

PHYS 3309 Introduction to Medical Imaging

PHYS 4312 Introductory Nuclear Engineering and Health Physics Concepts

ii – Minor – 18 hours (9 advanced)

iv – Electives – 3 hours

c – Educational Physics – 45 hours (40 advanced)

i – Educational Physics – 6 hours (6 advanced)

PHYS 4392 Research Methods

PHYS 3330 Functions and Modeling

ii – Additional Math Courses – 15 hours (12 advanced)

MATH 2318 Linear Algebra

MATH 3352 Modern Geometry I

MATH 3343 Introduction to Mathematical Software

MATH 3361 Applied Discrete Mathematics

MATH 4337 Probability and Statistics I

iii – UTeach Certification – 24 hours (22 advanced)

Area of Certification: Physics/Mathematics (7-12)

UTCH 1101 Inquiry Approaches to Teaching

UTCH 1102 Inquiry-Based Lesson Design

UTCH 3301 Knowing and Learning in Mathematics and Science

UTCH 3302 Classroom Interactions
UTCH 3303 Project-Based Instruction
UTCH 4601 Apprentice Teaching
UTCH 4101 Apprentice Teaching Seminar
READ 4305 Content Area Literacy
MATE 3317 Perspective in Mathematics and Science (or PHIL 3317)

TOTAL CREDIT HOURS FOR GRADUATION (MINIMUM) – 121 HOURS

TOTAL ADVANCED HOURS (MINIMUM) – 58 HOURS

ADMISSION, PROGRESSION, AND GRADUATION REQUIREMENTS, if applicable:

Progression requirements

Admission to the College of Education and P-16 Integration is required for participation in Apprentice Teaching and Seminar (UTCH 4101, 4601). Students unable to be admitted to UTCH 4601 and UTCH 4101 will be required to substitute 4 advanced hours, as recommended by advisor.

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.