

*(Focus: Non-Teacher Certification or 7<sup>TH</sup> – 12<sup>TH</sup> Grade UTeach Certification)*

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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.

## **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**

#### **020 - Mathematics – 3 hours**

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

#### **030 - 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

#### **090 - Integrative and Experiential Learning – 6 hours**

CSCI 1380 Computer Science I

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.