

PHYS 3500K: Computational Physics I

3 Credit Hours

Prerequisite: Grades of "C" or higher in PHYS 2212 and PHYS 2212L

This course utilizes introductory computer programming to analyze situations that are unique to physics. Students will enhance their computational thinking by using these methods and learn to obtain high accuracy approximate solutions to physics problems that are not solvable by analytic means. No prior programming knowledge will be assumed and the basics of one or more of the standard programming languages C/C++, Fortran, Python will be included in the course instruction.

PHYS 3710: Modern Physics

3 Credit Hours

Prerequisite: Grade of "C" or higher in PHYS 2212 and PHYS 2212L

The topics covered in this course constitute the most fundamental background in modern physics. The main objective of this course is to provide the student with a basic understanding of the physical laws and phenomena that constitute the framework leading to quantum mechanics. Students will strengthen their knowledge of special relativity and explore aspects of the quantum theory of wave/particle duality and the probabilistic interpretation. Students will learn the Schrödinger's equation, its solutions for simple potentials, and properties of the one-electron atom. Students will also study applications of quantum principles to atomic, molecular and nuclear structures.

PHYS 3720L: Modern Physics Laboratory

1 Credit Hours

Concurrent: PHYS 3710

This course, complements the material in Modern Physics. Students will gather data in x-ray diffraction, photoelectric effect and beta decay. They will also estimate the e/m ratio and study the spectra of hydrogen, helium and mercury.