U754-104: General Physics II

Course Format: Online

Course Author: Mark Quigley, Ph.D.

Course credits: 3
Pre/Corequisites: Completion of U754-103 General Physics I with a grade of C or better or the equivalent; Appropriate for advanced high school and first-year-or-higher college students.

Course Description: General Physics II is a continuation of General Physics I (U754-103). In this traditional, non-calculus based, second semester physics course, students will study three themes: light and optics, electricity and magnetism, and modern physics.

Required Course Materials

- R. A. Serway and C. Vuille*, Essentials of College Physics*, 1st ed. (Brooks/Cole, 2007). ISBN-13: 978-0495106197
- Scientific pocket calculator (a simple one will do—you don't need a graphical display model)

Optional/Recommended Course Materials

- R. A. Serway and C. Vuille, *Student Solutions Manual/Study Guide,* Volume 2. ISBN-13: 978-0495107828

Hardware Requirements

- You will need a webcam, speakers, and microphone. You will complete your exams through an online proctor that requires all three components.
- You will need access to a scanner to upload completed worksheets.

Course Learning Objectives

- Analyze complex problems using quantitative reasoning.
- Solve optic and light problems using common laws of physics.
- Solve electricity and magnetism problems using equations for variables relating to capacitance, magnetic fields, and alternating current circuits.
- Explain fundamental concepts of modern physics such as the Heisenberg Uncertainty Principle, quantum mechanics, and atomic and nuclear physics.

Course Overview

General Physics II is broken into three main topics, each of which consists of written assignments and an associated exam. The basic structure of the course is as follows:

MODULE #	MODULE TOPIC	EVALUATED ACTIVITIES
Topic 1: Light and Optics		
1	Reflection and Refraction of Light	Written Assignment
2	Mirrors and Lenses	Written Assignment
3	Wave Optics & Optical Instruments	Written Assignment
	Exam 1: Light and Optics	Exam

Topic 2: Electricity and Magnetism		
4	Preparation: Electricity and Magnetism (Review of Mechanics)	Written Assignment
5	Electric Forces and Electric Fields	Written Assignment
6	Electrical Energy and Capacitance	Written Assignment
7	Current and Resistance & Direct Current Circuits	Written Assignment
8	Magnetism	Written Assignment
9	Induced Voltages and Inductance	Written Assignment
10	Alternating Current Circuits and Electromagnetic Waves	Written Assignment
	Exam 2: Electricity and Magnetism	Exam
Topic 3: Modern Physics		
11	Relativity	Written Assignment
12	Quantum Physics	Written Assignment
13	Atomic Physics	Written Assignment
14	Nuclear Physics	Written Assignment
15	Nuclear Energy and Elementary Particles	Written Assignment
	Exam 3: Modern Physics	Exam

Evaluation Methods
Your final grade will be based on your performance on the following:

1) Average of Written Assignments (50%)
2) Average of Exams (50%)

Written Assignments (50% of course grade)
There are twenty problems per written assignment. Each assignment includes both odd and even problems of varying levels of difficulty. Note that answers (though not solutions) to odd problems are given in the back of the textbook. Each problem counts for five points, and points are taken off in the following way:

- -1 if the arithmetic is wrong
- -2 if the algebra/mathematics is wrong
- -3 if the basic physics is wrong
- -4 or -5 if the problem is completely wrong

One written assignment consists of review questions from General Physics I; this is intended to prepare you for Topics Two (2) and Three (3).

Exams (50% of course grade)
Each exam consists of twelve problems, of which you must complete ten. You will be allowed to take up to two attempts per exam. If you elect to take the second attempt, your exam score will be averaged between the two attempts. For example, if you score a 60% on your first attempt, and then a 90% on your second attempt, your exam grade will be 75%.

Exam Method: Online with Proctoring Online

This course requires all students to complete exams online through our proctoring service. Students receive two attempts on each exam. If you elect to take a second attempt, the average score of both exams will be recorded.

Grading Scale
The following grading scale is used to evaluate all course requirements and determine your final grade:

A = 93–100	B = 83–87.9	C = 70–77.9	D = 60–69.9
AB = 88–92.9	BC = 78–82.9		F = Below 60

Pass/Fail Option

Students who enroll in an Independent Learning (IL) course under the pass/fail option will receive a final grade of S in place of a final grade equivalent to an A, AB, B, BC, or C and a final grade of U in place of a final grade equivalent to a D or F.