Tompkins Cortland Community College

Master Course Syllabus

Course Discipline and Number: PHSC 104 **Year: 2020-2021**

Course Title: General Physics I **Credit Hours: 4**

Attendance Policy: *To maintain good grades, regular attendance in class is necessary. Absence from class is considered a serious matter and absence never excuses a student from class work. It is the responsibility of all instructors to distribute reasonable attendance policies in writing during the first week of class. Students are required to comply with the attendance policy set by each of their instructors. Students are not penalized if they are unable to attend classes or participate in exams on particular days because of religious beliefs, in accordance with Chapter 161, Section 224-a of the Education Law of the State of New York. Students who plan to be absent from classroom activity for religious reasons should discuss the absence in advance with their instructors. See college catalog for more information.*

Services for Students with Disabilities: *It is the College's policy to provide, on an individual basis, appropriate academic adjustments for students with disabilities, which may affect their ability to fully participate in program or course activities or to meet course requirements. Students with disabilities should contact the Coordinator of Access and Equity Services, to discuss their particular need for accommodations. All course materials are available in alternate formats upon request.*

Course Description

This is the first half of a two-course sequence. Topics include motion, statics, dynamics, conservation of energy and momentum, rotation, waves, thermodynamics, fluids, vibrations, and sound. In the laboratory sessions, error analysis and graphical analysis are emphasized. The course is intended for those with an interest in physics and without a background in calculus. A scientific calculator is required. PHSC 104 fulfills the SUNY General Education Natural Sciences requirement. Prerequisites: MATH 120 or MATH 122, or 3 years of high school Regents Mathematics; prior completion or concurrent enrollment in ENGL 100 and RDNG 116 if required by placement testing. 4 Cr. (3 Lec., 2 Lab.) Fall and spring semesters.

Course Context/Audience

This course is appropriate for several audiences: the Liberal Arts and Sciences: Math/ Science major, for whom the course is one half of a restricted course pair; the student in any major who needs a laboratory science course as a general education requirement; and the student needing a foundation of knowledge in physics in order to pursue a related field such as computer science or health.

Basic Skills/Entry Level Expectations

Writing: WC College level writing skills are required. See course co-requisites or pre-requisites.

Math: MC College level math skills – Course requires college level math skills. See course description for co-requisite and/or prerequisite requirement(s).

Reading: R3 Course may be taken concurrently with RDNG 116.

Course Goals

By successfully completing this course, the student will

1. Understand the basic concepts associated with motion, statics, dynamics, conservation of energy and momentum, rotation, waves, thermodynamics, fluids, vibrations and sound.

2. Be able to do problems, employing algebra and trigonometry techniques along with laws of physics, in the topics mentioned above.

3. Be able to build a lab experiment, make measurements to test the theories studied in class, and analyze the data thus obtained using error and graphical analysis.

Course Objectives/Topics

Objective/Topic	% Course
Students will be able to demonstrate an understanding and the ability to use a scientific measurement system.	5%
Students will be able to demonstrate an understanding to use the laws of physics to predict the behavior of objects in translational motion in one or two dimensions, aware of how forces affect such motion.	22%
Students will be able to demonstrate an understanding of the concepts of work, energy, and momentum, and use appropriate theories about these concepts to predict the behavior of objects at rest or in translational motion.	15%
Students will understand the concepts and theories related to rotational motion, and employ these to solve problems about objects in such motion or at rest.	12%
Students will understand the concepts related to solids and fluids, and to thermodynamics and heat, and be able to solve problems involving these topics.	25%
Students will understand the concepts related to vibrations, waves, and sound, and be able to use those concepts to solve problems in these areas.	7%
Given a reasonable amount of guidance, students will assemble lab equipment, perform experiments, correctly use measuring tools to obtain data, and analyze the data using graphical or error analysis. Each experiment will be a test of one of the theories presented in the lecture part of the class.	14%

General Education Goals - Critical Thinking & Social/Global Awareness

CRITICAL THINKING OUTCOMES	**HOW DOES THE COURSE ADDRESS THE OUTCOMES** (Include required or recommended instructional resources, strategies, learning activities, assignments, etc., that must or could be used to address the goal/outcomes)
Students will be able to ➢ develop meaningful questions to address problems or issues. ➢ gather, interpret, and evaluate relevant sources of information. ➢ reach informed conclusions and solutions. ➢ consider analytically the viewpoints of self and others.	**Not addressed.**
SOCIAL/GLOBAL AWARENESS OUTCOMES	**HOW DOES THE COURSE ADDRESS THE OUTCOMES** (Include required or recommended instructional resources, strategies, learning activities, assignments, etc., that must or could be used to address the goal/outcomes)
➢ Students will begin to understand how their lives are shaped by the complex world in which they live. ➢ Students will understand that their actions have social, economic and environmental consequences.	**Not addressed.**

Instructional Methods
Traditional lecture works very well in presenting the concepts and techniques of the course. Discussion of homework problems in each class, with some time set aside for students to try new problems, is also effective. In the lab sessions, it helps to spend five to twenty minutes at the beginning to explain how the experiment to be performed that day will demonstrate some theory that was already presented in lecture. If students work with partners in lab, they seem to learn quite a bit from each other. The most effective sequence of topics is that given by the chapter order in the textbook listed below. Computer software, such as Interactive Physics, and calculators provide a wonderful reinforcement of topics studied in lecture or lab.

Methods of Assessment/Evaluation

Method	% Course Grade
Frequent quizzes	30-50%
Lab Reports and assignments	15-30%
Final Exam (must be comprehensive)	15-30%
Lab Final Exam	8-16%

Text(s)
College Physics, Raymond A. Serway, Jerry S. Faughn, Chris Vuille, and Charles A. Bennett, 2012, Brooks Cole.
Required:

Bibliography
Other Learning Resources

Audiovisual Physics Timeline, mural outside the physics lab (Room 260). Mechanical Universe and Beyond, video series
Electronic Interactive Physics, installed on computers in the library classroom.
Other No resources specified