Tompkins Cortland Community College

Master Course Syllabus

Course Discipline and Number: PHSC 211 **Year: 2023-2024**
Course Title: Physics I (Mechanics and Heat) **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 semester of an integrated three-semester sequence. Topics include motion, static and dynamic systems, conservation of energy and momentum, rotation, elasticity, harmonic motion, fluid mechanics, heat, heat transfer, and thermodynamics. The laboratory will emphasize techniques of error analysis and graphical analysis. PHSC 211 fulfills the SUNY General Education Natural Sciences requirement. PHSC 104 or NYS Regents Physics strongly recommended. A scientific calculator is required. Prerequisites: MATH 201; RDNG 116 if required by placement testing; prior completion or concurrent enrollment in ENGL 100. 4 Cr. (3 Lec., 2 Lab.) Spring semester.

Course Context/Audience

This first semester of an integrated three-semester sequence intended primarily for Engineering Science and other students requiring a calculus based physics course.

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: R4 Before taking this course, students must satisfactorily complete RDNG 116 or have assessment indicating that no reading course was required.

Course Goals

The student who successfully completes this course should be able to:

1. Demonstrate his/her understanding of the basic terms and concepts covered in the course.
2. Solve problems of up to moderate difficulty in the text for the topics covered. This includes problems involving calculus and vector mechanics (unit vectors, dot products, and cross products).
3. Analyze data using error analysis.
4. Use common laboratory equipment to measure, collect and record laboratory data for analysis.

Course Objectives/Topics

Objective/Topic	% Course
Kinematics	10%
Laws of Motion/ Circular motion	10%
Work and Energy/ Potential Energy/ Conservation of Energy	10%
Momentum/ Impulse/ Conservation of Momentum	10%
Rotation of rigid bodies	10%
Angular momentum/ Torque	10%
Equilibrium	10%
The Law of Gravity	10%
Oscillatory motion	10%
Elasticity/ Fluid mechanics	5%
Thermodynamics	5%
Labs will include: The Simple Pendulum; Acceleration of Gravity; Error Analysis; Graphical Analysis; Rolling Objects; Simple Harmonic Motion: Fluid Flow in Tubes; and Newton's Law of Cooling.	

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
Course material will be presented in three hours of lecture/problem solving sessions per week and two hour lab/exam sessions per week.

Methods of Assessment/Evaluation

Method	% Course Grade
Exams	60%
Labs	20%
Final exam	20%

Text(s)
Physics for Scientists and Engineers, Serway/Beichner, 8th Edition

Bibliography
No print resources specified

Other Learning Resources

Audiovisual The Mechanical Universe; Annenberg 1984
Electronic
Other