

**PELLISSIPPI STATE COMMUNITY COLLEGE
MASTER SYLLABUS**

**NON-CALCULUS-BASED PHYSICS I
PHYS 2010**

Class Hours: 3

Laboratory Hours: 3

Credit Hours: 4

Revised: Fall 2016

Catalog Course Description:

This Course includes the basic principles of physics with their applications in pre-medical, -dental, -pharmacy, and -veterinary programs and covers mechanics, heat, and wave motion including sound. Course includes three hours of lecture and three hours of laboratory applications.

Prerequisites:

MATH 1730 or MATH 1710 and MATH 1720

Corequisites:

none

Textbook(s) and Other Course Materials:

Physics by Cutnell & Johnson, 9th Edition (Wiley) may be used as the course reference. The course material as well as its related laboratory manual are available at PSCC Website.

Week/Unit/Topic Basis:

Week	Topics	Laboratory
1	Chapter 1: Systems of Units: Area, Volume, Velocity, Acceleration, and Force	Problems Session: Trigonometry Review and Mass Density Problems
2	Chapter 1: Vectors, Vector Addition, Graphical and Components Methods	Experiment 1: Density Measurement
3	Chapter 2: Motion in one Dimension Displacement, Velocity, Acceleration, Equation of Motion, & Freely Falling of Objects	Experiment 2: Vector Addition: (Graphical Method)
4	Chapter 3: Motion in Two Dimensions The Motion of a Projectile	Experiment 3: Vector Addition (Force Table)
5	Chapter 4: Force and Motion Newton's Laws, Friction, and Applications of Newton's Laws	Experiment 4: Measurement of "g", Gravity Acceleration
6	Chapter 4 Continued... Newton's Laws, Friction, and Applications of Newton's Laws	Experiment 5: Coefficient of Kinetic Friction
7	Chapter 5: Uniform Circular Motion Centripetal Force, Acceleration, and Application	Experiment 6: Centripetal Force

Week	Topics	Laboratory
8	Chapter 6: Work, Energy, Power, Energy Conservation Law, and Work-K.E. Theorem	Experiment 7: Newton's Second Law
9	Chapter 7: Impulse, Momentum, Conservation of Linear Momentum, Elastic and Inelastic collisions	Experiment 8: Conservation of Energy
10	Chapter 8: Rotational Kinematics: Angular Motion, Centripetal Acceleration and Tangential Acceleration Chapter 9: Rotational Kinetic: Torque, Mass Moment of Inertia, Newton's 2nd Law	Problems Session
11	Chapter 10: Simple Harmonic Motion: Linear Spring, Hooke's Law, Oscillatory Motion, Mass-Spring System	Problems Session
12	Chapter 11: Fluid Statics, Density, Pressure, Liquid Pressure, Archimedes & Pascal Principles	Experiment 9: Archimedes' Principle
13	Chapter 12: Temperature and Heat Heat Calculation (Temperature Change) Heat Calculation (Phase Change)	Experiment 10: Specific Heat Measurement
14	Chapter 14: Expansion of Gases Kinetic Theory of Gases Perfect Gas Law Chapter 16: Waves Waves, Sound, and Doppler Effect	Experiment 11: Speed of Sound (Air Column Resonance)
15	Final Exam	

Course Goals*:

The course will

- Expand students' knowledge of physics principles in order to enhance their ability in applying scientific method as they pursue their goals and dreams in life. (V2, V3, V4, and V5)
- Guide students in taking a logical approach in obtaining experimental data in order to make an objective analysis of the results. (V1, V2, and V3)
- Enhance students' critical thinking ability and problem-solving skills. (V1 and V2)
- Enhance students' verbal and writing skills as a result of evidence-based analysis. (V3)
- Enhance effective use of mathematics. (V2)
- Develop an understanding of the importance of life-long learning and personal development. (V4 and V5)

*Roman numerals after course objectives reference the TBR general education goals.

Expected Student Learning Outcomes*:

Students will

- Apply learned physics concepts to theoretical and practical situations. (A, through F)
- Apply learned physics concepts to estimate an unknown parameter in a given practical situation by using the physics principle(s) involved. (A, through F)
- Recognize and identify the use of equipment and machines based on the units on their gauges. (A and F)

4. Have an understanding of energy calculation to estimate energy cost in a given situation. (A, C, D, E, and F)
 5. Perform necessary conversions between Metric and non-Metric units and systems. (A and E)
 6. Apply the kinematics equations to describe motion. (A, C, and E)
 7. Apply the kinetics equation in force-motion situations. (A, C, and E)
 8. Solve circular motion problems involving centripetal acceleration and force. (A, C, and E)
 9. Calculate the work done, energy involved, and energy conversions in a given problem. (A, C, and E)
 10. Solve problems involving rotational motion due to an applied torque. (A, C, and E)
 11. Solve temperature and heat problems with or without phase changes. (A, C, and E)
 12. Solve problems involving thermal expansion in solids, fluids, and gases. (A, C, and E)
 13. Solve density, pressure, and liquid pressure, problems as well as apply Pascal's and Archimedes' principles in buoyancy and hydraulic equipment problems. (A, C, and E)
 14. Have the knowledge to resolve vectors into components to simplify problems. (A, C, and E)
 15. Have an understanding of the law and applications of the linear momentum conservation. (A, C, and E)
 16. Apply the ideal gas law to problems including isometric, isothermal, and isobar processes. (A, C, and E)
 17. Have an understanding of Oscillatory motion, Wave motion, frequency, angular frequency, period, amplitude, and wave speed and apply them to simple problems that involve such parameters. (A, through F)
 18. Apply the resonance of sound waves in open or closed pipes to measure the speed of sound. (A, C, and E)
- * Capital letters after Expected Student Learning Outcomes reference the course goals listed above.

Evaluation:

- A. Testing Procedures: 75% of grade

This 75% is the mean theory grade calculated as

For Campus-based Students:

Theory Grade = 0.80 (Tests + Quizzes) + 0.20 (Comprehensive Final)

There will be 4 to 6 tests each of which include problems as well as multiple-choice questions. There will be 2 quizzes: one on Chapter 12 and one on Chapter 16.

For Online Students: Theory Grade = 0.70 (Tests) + 0.30 (Final)

There will be an online chapter test each week. **Final Exam must be taken on campus.**

- B. Laboratory Expectations: 25% of grade

Laboratory Grade = (the sum of reports grades) / (the number of the reports). 11 experiments* are designed for the course. Each experiment requires a report that must be at least spell-checked. Procedures for a standard lab report will be given by your instructor. **To avoid a ZERO Laboratory Grade**, at least 6 reports must be turned in. **No late lab report(s) will be accepted and there are No Lab Make-ups.**

- C. Field Work: _____% of grade

An instructor who finds an opportunity for site visits or field work may give a maximum of 10% to this evaluation measure by adjusting the percentage in Part A.

- D. Grading Scale: 91 to 100: A, 87 to 91: B+, 81 to 87: B, 77 to 81: C+, 70 to 77: C, & 60 to 70: D.

Policies:**A. Attendance Policy:**

Pellissippi State expects students to attend all scheduled instructional activities. As a minimum, students in all courses (excluding distance learning courses) must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course. Individual departments/programs/disciplines, with the approval of the vice president of Academic Affairs, may have requirements that are more stringent. In very specific circumstances, an appeal of the policy may be addressed to the head of the department in which the course was taken. If further action is warranted, the appeal may be addressed to the vice president of Academic Affairs.

B. Academic Dishonesty:

Academic misconduct committed either directly or indirectly by an individual or group is subject to disciplinary action. Prohibited activities include but are not limited to the following practices:

- Cheating, including but not limited to unauthorized assistance from material, people, or devices when taking a test, quiz, or examination; writing papers or reports; solving problems; or completing academic assignments.
- Plagiarism, including but not limited to paraphrasing, summarizing, or directly quoting published or unpublished work of another person, including online or computerized services, without proper documentation of the original source.
- Purchasing or otherwise obtaining prewritten essays, research papers, or materials prepared by another person or agency that sells term papers or other academic materials to be presented as one's own work.
- Taking an exam for another student.
- Providing others with information and/or answers regarding exams, quizzes, homework or other classroom assignments unless explicitly authorized by the instructor.
- Any of the above occurring within the Web or distance learning environment.

Please see the Pellissippi State Policies and Procedures Manual, Policy 04:02:00 Academic/Classroom Conduct and Disciplinary Sanctions for the complete policy.

C. Accommodations for disabilities:

Students that need accommodations because of a disability, have emergency medical information to share, or need special arrangements in case the building must be evacuated should inform the instructor immediately, privately after class or in her or his office. Students must present a current accommodation plan from a staff member in Disability Services (DS) in order to receive accommodations in this course. [Disability Services](#) (<http://www.pstcc.edu/sswd/>) may be contacted via [email](#) or by visiting Alexander 130.