

GENERAL PHYSICS I

PHY 201

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Text: Fundamentals of Physics, Halliday, Resnick, & Walker (9th Ed.)

Lab.: General Physics Lab Manual, Ochoa, Kolp, Dalafave, Gleeson, and Pfeiffer (4th Ed.)

Web pages: www.tcnj.edu/~ochoa/courses/GPI.htm

[Wiley Plus Electronic Homework](#)

I. Course Description

Calculus based treatment of laws of classical mechanics, wave motion and sound. Understanding of the important principles is emphasized. Problem solving and laboratory work are integral parts of the course.

II. Course Objectives

1. To provide a foundation in physics necessary for further study in science, engineering and technology.
2. To provide an appreciation of the nature of physics, its methods and its goals.
3. To contribute to the development of the student's thinking process through the understanding of the theory and application of this knowledge to the solution of practical problems.

III. Course Outline

1. Physics and Measurement. (Ch. 1)
Measuring things. International system of units. Changing units. Length, time and mass.
Wiley Plus Electronic Homework 1
2. Motion in One Dimension. (Ch. 2)
Motion. Position and displacement. Velocity. Acceleration. Constant acceleration. Free-fall acceleration.
Wiley Plus Electronic Homework 2
3. Vectors. (Ch. 3)
Vectors and scalars. Adding vectors geometrically. Components of vectors. Unit vectors. Adding vectors by components.
Wiley Plus Electronic Homework 3.
4. Motion in Two Dimensions. (Ch. 4)
Position and displacement vectors. Velocity and acceleration vectors. Projectile motion. Uniform circular motion. Tangential and Centripetal Acceleration. Relative motion.
Wiley Plus Electronic Homework 4

Test 1

Date: TBA

5. Newton's Laws of Motion and Applications. (Ch. 5-6)

Concept of force. Newton's first law. Mass. Newton's second and third laws. Applications of Newton's laws. Friction. Drag force and terminal speed. Dynamics of circular motion.
Wiley Plus Electronic Homework 5 & 6.

6. Work and Conservation of Energy.- (Ch. 7-8)

Kinetic energy. Work. Power. Potential energy. Gravitational and elastic potential energy. Work done by nonconservative forces. Conservation of energy.
Wiley Plus Electronic Homework 7 & 8.

Test 2

Date: TBA

7. Linear Momentum and Collisions.- (Ch. 9)

Concept of linear momentum. Conservation of momentum. Systems with varying mass. Collisions. Impulse and linear momentum. Elastic collisions. Inelastic collisions. Collisions in two dimensions. Center of mass.
Wiley Plus Electronic Homework 9.

8. Rotation of a Rigid Object about a Fixed Axis (Ch. 10)

Translation and rotation. Angular velocity and acceleration. Constant angular acceleration. Relating the linear and angular variables. Torque. Torque and angular acceleration. Work and rotational kinetic energy.
Wiley Plus Electronic Homework 10.

9. Angular Momentum (Ch. 11)

The vector torque. Angular momentum. Conservation of angular momentum.
Wiley Plus Electronic Homework 11.

10. Static Equilibrium.- (Ch. 12)

Requirements of equilibrium. Center of gravity. Applications.
Wiley Plus Electronic Homework 12.

Final Exam

IV. Laboratory

Lab. 1. Motion with Constant Speed.

Lab. 2. Motion with constant acceleration.

Lab. 3. Vector analysis - addition of displacements.

Lab. 4. Test 1 Preparation – peer instruction exercises.

Lab. 5. Projectile motion.

Lab. 6. Newton's Second Law.

Lab. 7. Centripetal Motion

Lab. 8. Hooke's law: Spring - mass system.

Lab. 9. Test 2 Preparation – peer instruction exercises.

Lab. 10. Ballistic pendulum.

Lab. 11. Linear Collisions.

Lab. 12. Conservation of Angular Momentum.

V. Assessment of Student Performance

1. Electronic Homework (10% of course grade)
2. tests (35% of course grade)
3. final exam (35% of course grade)
4. lab. grade (20% of course grade)

For lab grade student must complete in a satisfactory manner the laboratory exercises and the laboratory notebook. Students are expected to be in the lab on time, **points will be deducted for tardiness** (if a student is more than 20 minutes late he/she will receive a zero grade for that lab).

Grading Scale	
Final Score	Letter Grade
92.5 - 100	A
89.5 – 92.4	A-
86.5 – 89.4	B+
82.5 – 86.4	B
79.5 – 82.4	B-
76.5 – 79.4	C+
72.5 – 76.4	C
69.5 – 72.4	C-
66.5 – 69.4	D+
59.5 – 66.4	D
0 – 59.4	F

VI. Attendance

Students are expected to attend class but if they choose not to this will have no negative effect on their grade. Students that do attend and participate or show effort in class may receive extra credit on their tests.

No makeup labs, tests, or exams will be given unless there is an emergency situation. In that case students are expected to contact the instructor no later than 24 hours after the missed lab or test; otherwise they will be given a zero grade for the missed evaluation.

TCNJ's attendance policy can be found at: <http://www.tcnj.edu/~recreg/policies/attendance.html>

VII. Academic Integrity Policy

Academic dishonesty is any attempt by the student to gain academic advantage through dishonest means, to submit, as his or her own, work which has not been done by him/her or to give improper aid to another student in the completion of an assignment. Such dishonesty would include, but is not limited to: submitting as his/her own a project, paper, report, test, or speech copied from, partially copied, or paraphrased from the work of another (whether the source is printed, under copyright, or in manuscript form). Credit must be given for words quoted or

paraphrased. The rules apply to any academic dishonesty, whether the work is graded or ungraded, group or individual, written or oral.

TCNJ's academic integrity policy is available on the web:

<http://www.tcnj.edu/~academic/policy/integrity.html>.

VIII Americans with Disabilities Act (ADA) Policy

Any student who has a documented disability and is in need of academic accommodations should notify the professor of this course and contact the Office of Differing Abilities Services (609-771-2571). Accommodations are individualized and in accordance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1992.

TCNJ's Americans with Disabilities Act (ADA) policy is available on the web:

<http://www.tcnj.edu/~affirm/ada.html> .