

PHYSICS DEPARTMENT

COURSE OUTLINE

PHYS 104 General College Physics 1

This is the first part of a survey of physics primarily for students in life sciences and non-science programs. Students explore kinematics, dynamics, work, energy and power, thermal energy, nuclear energy and electricity. Students will also be introduced to some recent developments in physics and their effect on society.

OFFERED:	Fall, Winter, Summer
CREDIT:	4
IN-CLASS WORKLOAD:	4 lecture, 2 lab (semester)
PRE-/CO-REQUISITES:	Physics 11 or PHYS 060 or PHYS 150 or departmental assessment, and one of: Math 063, Math 173; or Math 11 or assessment

REQUIRED MATERIALS:

Textbook: Physics, Principles with Applications, 6th edition,
Douglas C. Giancoli

Physics 104/105 lab manual

Scientific calculator (any calculator is acceptable with the exception of personal computers)

Graph paper (must be either 10 lines/inch or millimeter graph paper)

DEPARTMENT POLICIES REGARDING TESTING:

1. Students must write quizzes, tests, midterm tests, etc., on the date and time assigned by the instructor. Instructors are not required to provide make-up tests. At their discretion, instructors may waive a test or provide a make-up test only in the event of documented illness or other extenuating circumstances.
2. Midterm tests may be dropped if: (a) a first-class mark is obtained on the comprehensive final exam, and (b) all term work has been completed and is judged to be satisfactory. In this case, the final grade for the course may be based on a combination of the final exam and the lab mark.

DEPARTMENT POLICIES REGARDING LABS:

1. All assigned laboratory exercises and reports must be completed with an overall grade of 60% in order to obtain credit for this course. A lab may be waived or made up at a later time only in the case of documented illness or other extenuating circumstances.
2. A student who is repeating a Physics course does not have to complete the laboratory exercises a second time if an average lab grade of 70% or better was obtained.

STUDY TIME

It is recommended that between 5 and 10 hours per week (or more for students with a weak background) be spent studying for this course outside of class time.

GRADING

The standard mark distribution for this course is as follows:

Final Exam	50%
Midterms and other work	40%
<u>Lab Reports</u>	<u>10%</u>
	100%

This distribution may be amended by the instructor (see your Instructor's Information sheet).

GRADE SCALE

Final letter grades are normally assigned as follows (subject to above conditions):

Percentage	Letter Grade
95 to 100	A+
90 to 94	A
85 to 89	A-
80 to 84	B+
75 to 79	B
70 to 74	B-
65 to 69	C+
60 to 64	C
50 to 59	D
below 50	F

OUTLINE:

1. Concept of Work and Energy (Chapter 6)

- 1.1. Definition of Work
- 1.2. Definition of Kinetic, Potential and Elastic Energy
- 1.3. Work-Energy Principle
- 1.4. Definition of Conservative, Non-conservative Forces
- 1.5. Conservation of Energy (concept)

2. Electricity (Chapter 18 and 19)

- 2.1. The Electric Current
- 2.2. Voltage, Resistance and Current: Ohm's Law
- 2.3. Resistivity
- 2.4. Electric Power (DC only)
- 2.5. Household Power
- 2.6. DC Circuit Analysis (Simple Circuits)
- 2.7. EMF and Terminal Voltage

3. Heat (Chapter 13, 14 and 15)

- 3.1. Thermometry
- 3.2. Concept of Thermal Equilibrium: Zeroth Law of Thermodynamics
- 3.3. Thermal Expansion
- 3.4. Concept of Heat, Temperature, Internal Energy
- 3.5. Specific Heat, Latent Heat and Calorimetry
- 3.6. Heat Transfer

4. Nuclear Physics (Chapter 30 and 31)

- 4.1. Nuclear Structure
- 4.2. Binding Energy
- 4.3. Radioactivity
- 4.4. Nuclear Reactions (civil, military)
- 4.5. Effect of Radiation on Matter, Radiation Damage

5. Mechanics (Chapter 2, 3, 4, 5 and 6)

- 5.1. Review of One-Dimensional Kinematics
- 5.2. Kinematics in Two Dimensions: Vectors with Trigonometry
- 5.3. Newton's Three Laws of Motion: Dynamics in Two Dimensions
- 5.4. Friction, Inclined Planes
- 5.5. Uniform Circular Motion and Gravitation
- 5.6. Mechanical Work, Energy and Power (Revisited)