



**Department of Mathematics, Physics and Statistics**  
*College of Arts and Sciences*  
*Visayas State University, Visca, Baybay City, Leyte*

**COURSE OUTLINE**  
*(Revised May 2016)*

COURSE NUMBER : **PHYSICS 11- B**  
COURSE TITLE : General Physics I  
COURSE DESCRIPTION : Fundamental concepts on force, work and energy; heat and temperature measurements; properties of matter; electricity and magnetism.  
PREREQUISITE : Math 12  
6 hrs. per week (3 lec., 3 lab.)  
Credit: 4 units

**OBJECTIVE OF THE COURSE:**

1. To acquire an understanding of the basic concepts, principles and laws of physics to cope with the present mechanized environment.
2. To stimulate critical and analytical thinking among students as basis for making them more intelligent and more responsive members of society.
3. To acquire skill in manipulating measuring instruments and in conducting experiments correctly, thus it will allow students to make operational definitions, formulate questions and hypothesis, gather and interpret data, draw conclusions and design experiments and apparatus.
4. To develop appreciation and sense of gratitude to men and women who haven laboured unselfishly in the pursuit of scientific truths.
5. To show the relationship between physics and the "real world".
6. To develop interest in Physics particularly to young people who possesses talent to pursue careers in science and technology.
7. To be able to discuss intelligently science news and inventions.

**I. INTRODUCTION (5 hrs.)**

1. Why study Physics?
2. The Nature of Physics (five greatest theories in physics)
3. Idealized Models, & Suggested way of solving Physical Problems
5. Standards and Units, Conversions, Uncertainty and Significant Figures, and Estimates and Order of Magnitude
6. Vector Analysis
  - a. Vectors and Vector Addition
  - b. Resultant
  - c. Suggested experiments/demonstration
    1. Vectors; graphical methods
    2. Vectors; rectangular resolution and polygon theorem

**II. KINEMATICS (7 HRS.)**

1. Definitions: Speed, velocity, acceleration, uniformly accelerated linear motion
2. Equations of uniformly accelerated linear motion
3. Freely falling bodies
4. Suggested experiments/demonstrations
  - a. Tickets tape timer
  - b. Uniform velocity apparatus

**III. DYNAMICS (4 HRS.)**

1. Newton's laws of motion and its applications
2. Friction: static and kinetic friction, coefficient of friction, angle of repose, fluid friction.
3. Uniform circular motion and gravitation (concept only)
4. Suggested experiments/demonstrations
  - a. Newton's second law of motion - at woods machine
  - b. Kinetic and static friction

**IV. LAW OF CONSERVATION OF MECHANICAL ENERGY (8 hrs.)**

1. Work and Kinetic Energy
  - Work and Kinetic Energy
  - Work and Energy with Varying Forces
  - Power
2. Potential Energy and Energy Conservation
  - Gravitational Potential Energy & Elastic Potential Energy
  - Conservative and Non-conservative Forces
3. Law of Conservation of Mechanical Energy
4. Suggested experiments/demonstrations
  - a. The tension and compression spring.
  - b. Simple Machines

**V. LAW OF CONSERVATION OF LINEAR MOMENTUM (7 hrs)**

1. Momentum and Impulse
  - Momentum and Kinetic Energy Compared
1. Conservation of Momentum
2. Inelastic Collisions
  - Completely Inelastic Collisions

3. Elastic Collisions
  4. Suggested experiments/demonstrations: clicks.
- VI. GRAVITATIONS (6 hrs.)
1. Law of universal gravitation
  2. Gravitational potential energy
  3. Motion of satellites
- VII. FLUID MECHANICS
1. Density, Pressure in a Fluid, & Buoyancy
  2. Continuity equation, & Bernoulli's Equation
- VIII. THERMODYNAMICS
1. Temperature and temperature scale
  2. Thermal expansion
  3. Quantity of heat, & Phase change
- IX. ELECTROSTATIC (5 hrs.)
1. Electrification
  2. Coulomb's law
  3. Electric field and potentials
  4. Potential difference
  5. Suggested experiments/demonstrations
    - a. mapping equipotential lines and field
    - b. electroscopes
    - c. electrostatic generator
- X. CURRENT ELECTRICITY (7 hrs.)
1. Definition; current, resistance and voltage
  2. Sources of emf, & Ohm's Law
  3. Simple circuits
    - a. Series, parallel and series-parallel combination
  4. Suggested experiments
    - a. Ohm's law,
    - b. Resistor color code
    - c. Voltaic cell

**Text Book:**

Young & Freedman 2013, **UNIVERSITY PHYSICS w/ Modern Physics, 12<sup>th</sup> ed.**

**References**

1. Giancoli, Douglas C., PHYSICS for Scientists and Engineers with Modern Physics, 2<sup>nd</sup> Ed.
2. Asperilla, Jose, et al. College Physics, Manila: Almar. Phoenix Publishing House, 1969.
2. Weber, White and Manning, et al. College Physics, New York: MacGraw-Hill. Book Co. 1974.
3. Resnick and Halliday, Physics, New York: John Wiley and Sons Inc. 1978
4. Smith and Cooper. Elements of Physics, New York: McGraw-Hill Book Co.:1972
5. Buckwalter, Gary. College Physics New York, McGraw-Hill Book Co. 1987
6. Wilson, Jerr. College Physics. Englewood Prentice Hall 1994
7. Physics: An Introduction by Bolemen (1989)
8. College Physics by Buck Walter (1987)
9. College Physics by Wilson (1994)
10. College Physics, 7th Edition by Sears, Zemansky & Young C. 1991.
11. Fundamentals of Physics, 4th Edition by Halliday, Resnick & Walker C. 1994.
12. Classical and Modern Physics Vol. I & 2 (Combined) by Kenneth Ford C. 1972.
13. Handbook of chemistry and physics (1994)

**Grading System:**

- Physics 11 Final Grades =  $\frac{1}{3}$  (midterm grade) +  $\frac{2}{3}$  (post midterm grade)
- Term Grades =  $\frac{1}{3}$  (laboratory grade) +  $\frac{2}{3}$  (lecture grade)
- Lecture grade = (obtain points from... quizzes + attendance + Exams)  $\div$  Total point x 100%

**Course Requirements:**

- Grades in Math 12 or Math 13 (*from registrar or from your instructor*)
- Problem sets and assignments (*Solutions to problem sets should be written on short size bond paper*)
- Term Exam permits

**Classroom policy:**

- Cellphones are not allowed during Exams.
- Submit solutions to all Problem Sets & Assignments
- NO REMOVAL EXAMS

**Website:** [www.mfsacedon08.webs.com](http://www.mfsacedon08.webs.com) (*for Exam results, grades, downloads, and other information*)

Prepared by:



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