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-A
COURSE TITLE	:	General Physics I
COURSE DESCRIPTION	:	Fundamental concepts on force; kinematics and dynamics of motion; work, energy & power; principle of conservation of mechanical energy; and Law of universal gravitations.
PREREQUISITE	:	Math 12 or Math 13
		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 scope 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 labored 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.   UNITS, PHYSICAL QUANTITIES, AND VECTORS   (6 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.   Components of Vector, & Unit vectors
      d.   Products of Vectors: Scalar/Dot product and Vector/Cross Product
      e.   Suggested experiments/demonstration
         1.   Vectors; graphical methods
         2.   Vectors; rectangular resolution and polygon theorem

II. KINEMATICS (9 hrs.)
   1.   Motion Along a Straight Line
      •   Displacement, Time, and Average Velocity
      •   Instantaneous Velocity
      •   Average and Instantaneous Acceleration
      •   Motion with Constant Acceleration
      •   Freely Falling Bodies
   2.   Motion in Two or Three Dimensions
      •   Position and Velocity Vectors
      •   The Acceleration Vector
      •   Projectile Motion
      •   Motion in a Circle
      •   Relative Velocity
   3.   Suggested experiments/demonstrations
      a.   Tickets tape timer
      b.   Uniform velocity apparatus

III. DYNAMICS (10 hrs.)
   1.   Newton's laws of Motions
      •   Force and Interactions, Free-body diagram visualization.
      •   Newton's First Law
      •   Newton' Second Law
      •   Newton's Third Law
   2.   Application of Newton's Laws
      •   Using Newton's First Law: Particle in Equilibrium
      •   Using Newton's Second Law: Dynamics of Particles
      •   Frictional Forces
      •   Dynamics of Circular Motion

3. 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
   2. Conservation of Momentum
   3. Inelastic Collisions
      • Completely Inelastic Collisions
   4. Elastic Collisions
   5. Suggested experiments/demonstrations: clicks.
VI. STATICS (6 hrs.)
   1. Concept of force and equilibrium
   2. Concurrent and non-concurrent force
   3. First condition for equilibrium
   4. Second condition for equilibrium; torque
VII. GRAVITATIONS (6 hrs.)
   1. Law of universal gravitation
   2. Gravitational potential energy
   3. Motion of satellites

Text Book: Young **& Freedman 2013, UNIVERSITY PHYSICS w/ Modern Physics, 13th ed.**

References
   1. Giancoli, Douglas C., PHYSICS for Scientists and Engineers with Modern Physics, 2nd Ed.
   2. Asperilla, Jose, et al. College Physics, Manila: Alemar. Phoenia 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 = 1/3 (midterm grade) + 2/3 (post midterm grade)
   • Term Grades = 1/3 (laboratory grade) + 2/3 (lecture grade)
   • Lecture grade = (obtain points from… quizzes + attendance + Exams) ÷ 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 *(for Exam results, grades, downloads, and other information)*

Prepared by:

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