

PHYSICS 101
INTRODUCTORY PHYSICS I
(4.0; 4 credits)

Textbook: Physics for Scientists and Engineers

By: Serway and Beichner

Fifth Edition, 2000

Sauders College Publishing

Contents:

1. Physics & Measurement

Standards of length, time and mass, Dimensional analysis.

2. Motion in one dimension

Displacement, velocity and acceleration, motion in one dimension, freely falling object.

3. Vectors

Addition, scalar and vector products.

4. Motion in two dimensions

Two dimensional motion (projectiles & circular motion), uniform acceleration, tangential and radial acceleration.

5. Dynamics

Newton's laws & Applications, rectilinear and two dimensional motion, Static and Kinetic frictions.

6. Circular motion

Newton's Second law applied to uniform circular motion.

7. Work and Kinetic energy

Work done by a constant and variable force, work kinetic energy theorem, power.

8. Potential energy and Conservation of energy

Potential energy, Conservative and nonconservative forces, Conservation of mechanical energy.

9. Linear momentum and Collisions

Impulse and momentum, conservation of linear momentum, collisions, Elastic and inelastic collisions in one dimension, two dimensional collisions, Center of mass.

10. Rotation

Angular displacement, velocity and acceleration, angular and linear quantities, moments of inertia. Rotational energy.

11. Angular momentum

Torque, angular momentum and its conservation.

12. Oscillatory motion

Simple harmonic motion, Energy, the pendulum.

13. The law of Gravity

Newton's law of universal Gravitation, Kepler's laws and the motion of planets.

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