

Course Name: PHY-111 Technical Physics I

Date Updated: 4/2022

Credit Hours/week: Lec. 3, Lab 1 hrs./wk. – 4 cr.

BEGINNING: SPRING 2022

Catalog Description: The first semester of a two-semester sequence in technical physics. Topics include kinematics and dynamics of translational and rotational motion, conservation of energy, conservation of momentum, fluid statics and dynamics and heat.

Prerequisite: ENR-119, ENR-124 AND MAT-110, OR MAT-110 AND ENR-132 OR MAT-123

Text: Physics, Tippens, McGraw-Hill

The New Technical Physics I Laboratory Manual, Craven/Einstein, CPS

Supplementary Material: Scientific calculator

Any edition of any algebra-based introductory physics textbook. They all have the same basic information and the problems are generally all the same or similar. Schaum's Outline of College Physics

Syllabus:

Topics
Physical quantities and units
Vector quantities and arithmetic, graphically
Vector components; vector arithmetic with components
Displacement, velocity, relative velocity, speed, acceleration
Overview of Newton's laws of motion, mass, weight
One-dimensional kinematics with constant acceleration, free-fall
Two-dimensional kinematics with constant acceleration, projectiles
Newton's laws of motion: typical static and dynamic force applications
Angular displacement, angular velocity, and angular acceleration
Uniform circular motion
Applications of uniform circular motion
Work, kinetic energy, work-energy theorem
Gravitational potential energy
Conservative forces, non-conservative forces and the work-energy
Power
Impulse, momentum, conservation of momentum
Collisions
Torque; rotational equilibrium
Center of mass, center of gravity, moment of inertia, Newton's second law
Rotational dynamics examples; rotational energy and momentum
Fluid statics: density, pressure, pressure variation with depth
Measurement of pressure, Pascal's principle, Archimedes principle
Fluid dynamics: types of fluid flow; continuity
Fluid dynamics: Bernoulli's equation and applications

Students are expected to adhere to the policies of the County College of Morris. These can be accessed at: (insert link here)

Statement of Expected Course LEARNING OUTCOMES

- Demonstrate a knowledge and understanding of natural phenomena in the realm of physics
- Demonstrate how observation, hypothesis and experimentation provide the basis for the laws of physics that describe the everyday world
- Gather, organize, analyze critically, synthesize, evaluate and communicate scientific information clearly and effectively
- Demonstrate problem-solving skills
- Evaluate and draw scientific conclusions from numerical data and graphical information

Statement of Relation to Curriculum(s):

Required for Electronic Engineering Technology and Mechanical Engineering Technology majors, as well as others