

Physics 190
Mechanics and Thermodynamics
Cuyamaca College

Spring 2012

Instructor: Jerry Riley

Office: H 241

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Office Hours:

Monday 7:30 to 7:55 AM and 12:30 PM to 1:50 PM
Tuesday 7:30 to 7:55 AM and 12:30 PM to 1:50 PM
Wednesday 7:30 to 7:55 AM
Thursday 7:30 to 7:55 AM

Description:

This course deals with linear and rotational kinematics and dynamics, equilibrium, work, energy, momentum, gravitation, simple harmonic motion, the thermal properties of matter and thermodynamics.

The Physics 190, 200 and 210 sequence satisfies the lower division physics requirement for astronomy, chemistry, physics, engineering and pre-med majors.

Course Prerequisites:

Credit for or concurrent enrollment in Mathematics 180 (Calculus 1) (**a strong background in algebra, trig and word problems recommended**)

WITHOUT THE FOLLOWING SKILLS, COMPETENCIES AND/OR KNOWLEDGE, YOU WILL BE HIGHLY UNLIKELY TO SUCCEED IN THIS COURSE:

Ability to solve algebraic word problems by using substitution or simultaneous equations
Knowledge of trigonometric functions and their identities
Ability to solve linear, quadratic and trigonometric equations

Course Objectives (Expected Student Learning Outcomes)

Students will:

1. Recognize the basic concepts concerning kinematics, dynamics, energy, momentum, gravitation, oscillations and thermodynamics
2. Investigate and delineate the relationship between the theoretical principles and their practical applications
3. Use mathematical expressions to represent physical situations involving these subjects
4. Investigate, interpret and analyze the fundamental principles of physics
5. Calculate solutions to physics problems using the fundamental principles of physics and symbolic logic skills

During the lab students will:

1. Design experiments using the scientific method
2. Demonstrate laboratory technique by collecting data using both traditional and computer data acquisition methods, using computers to interpret and analyze numerical data and to generate a visual representation of the data
3. Evaluate the experimental results using techniques presented in class

Text:

Physics for Scientists and Engineers, Eighth Edition Combined, by Serway and Jewett

Grading:

80 % 5 Exams (Drop the lowest one) **There are no make-up exams!**

20 % ~ 10 Lab Reports / Computer Work (Drop the lowest one) **There are no make-up labs!**

Grade Cut Offs

- A 90 % to 100 %
- B 80 % to 89.99 %
- C 60 % to 79.99 %
- D 50 % to 59.99 %
- F 0 % to 49.99 %

Tentative Outline

Chap 2 Motion in One Dimension
Chap 3 Vectors
Chap 4 Motion in Two Dimensions
Exam 1

Chap 5 The Laws of Motion
Chap 6 Circular Motion and Other Applications of Newton's Laws
Chap 7 Energy of a System
Chap 8 Conservation of Energy
Exam 2

Chap 9 Linear Momentum and Collisions
Chap 10 Rotation of a Rigid Object About a Fixed Axis
Chap 11 Angular Momentum
Exam 3

Chap 12 Static Equilibrium and Elasticity
Chap 13 Universal Gravitation
Chap 15 Oscillatory Motion
Exam 4

Chap 19 Temperature
Chap 20 The First Law of Thermodynamics
Chap 21 The Kinetic Theory of Gases
Chap 22 Heat Engines, Entropy and the Second Law of Thermodynamics
Exam 5

This course adheres to the policies outlined in the Cuyamaca College catalogue. For further information, see Academic Policies stated in the catalogue.

I recommend you use the Supervised Tutoring services that are available to you. Refer to the class schedule for more information.

I strongly recommend regular attendance because history indicates a strong correlation between grades and attendance.