

**PALOMAR COLLEGE**  
**COURSE OUTLINE OF RECORD FOR**  
**DEGREE CREDIT COURSE**

X Transfer Course X A.A. Degree applicable course  
(check all that apply)

**COURSE NUMBER AND TITLE:** PHYS 230 - Principles of Physics

**UNIT VALUE:** 5

**MINIMUM NUMBER OF SEMESTER HOURS:** 112

**BASIC SKILLS REQUIREMENTS:** Appropriate language and computational skills.

**ENTRANCE REQUIREMENTS**

**PREREQUISITE:** Completion of, or concurrent enrollment in, MATH 141

**COREQUISITE:** None

**RECOMMENDED PREPARATION:** PHYS 120

**SCOPE OF COURSE:**

Classical mechanics, thermodynamics, and fluid dynamics. Required for students whose major field is physics, chemistry, or engineering.

**SPECIFIC COURSE OBJECTIVES:**

The successful student will be able to:

1. Demonstrate a comprehensive understanding of introductory classical mechanics, thermodynamics, and fluid dynamics which is intended for lower division students who are majoring in several science and engineering fields.
2. Apply physics concepts and principles of classical mechanics, thermodynamics, and fluid dynamics at the undergraduate college level.
3. Analytically solve quantitative physics problems.
4. Apply laws of classical mechanics, thermodynamics, and fluid dynamics to laboratory situations, perform experiments, collect and analyze data, and prepare and present reports.

**CONTENT IN TERMS OF SPECIFIC BODY OF KNOWLEDGE:**

**LECTURE:**

- I. Classical Mechanics
  - A. Vectors
  - B. Kinematics
  - C. Dynamics
  - D. Work and Energy
  - E. Linear Momentum
  - F. Collisions
  - G. Rotational Kinematics
  - H. Rotational Dynamics
  - I. Angular Momentum

- J. Harmonic Motion
- K. Wave Motion
- L. Gravitation
- II. Thermodynamics
  - A. Temperature, Heat, and the first law of thermodynamics
  - B. Kinetic theory of gases
  - C. Entropy and the second law of thermodynamics
- III. Fluids
  - A. Density and pressure
  - B. Fluids at rest
  - C. Pascal's Principle
  - D. Archimedes' Principle
  - E. Fluids in motion
  - F. Bernoulli's Equation

**LAB:**

Selected experiments dealing with the above subject matter.

**REQUIRED READING:**

Halliday, David, Robert Resnick, and Jearl Walker. Fundamentals of Physics Extended. 6<sup>th</sup> Ed. New York: John Wiley & Sons, 2000.

Wood, James M. Physics 230 Lab Experiments. Palomar College, 1991.

**SUGGESTED READING:**

Tipler, Paul A. Physics for Scientists and Engineers, Volume 1. 4th Ed. New York: Worth Publisher, 1998.

Fishbane, Paul M., Stephen Gasiorowicz, and Stephen T. Thornton. Physics for Scientists and Engineers, Volume 1. 2<sup>nd</sup> Ed. Upper Saddle River: Prentice Hall, 1996.

**REQUIRED WRITING:**

The course exams, outside assignments, and laboratory reports heavily emphasize the use of diagrams, data, and physics equations. The course requires formal lab write-ups or written laboratory summarizations as well as problem-solving exercises.

**OUTSIDE ASSIGNMENTS:**

**Students are expected to spend a minimum of three hours per unit per week in class and on outside assignments, prorated for short-term classes.**

Preparation includes such activities as readings in the assigned text, review of lecture and laboratory materials, and solving assigned problems.

**INSTRUCTIONAL METHODOLOGY:**

**Check all that apply:**

- lecture
- laboratory
- lecture-laboratory combination
- directed study

**DISTANCE LEARNING:**

**This course may be offered as a distance learning course and meets Title 5 regulations 55370, 55372, 55374, 55376, 55378, and 55380.**

Yes  No

**If yes, check all that apply:**

- Television Course (Video one-way, e.g. ITV, video cassette, etc.)
- Online Course (Text one-way, e.g. newspaper, correspondence, electronic file, etc.)
- Two-Way Video Conferencing (Two-way interactive video and audio)
- One-Way Video Conferencing (One-way interactive video and two-way interactive audio)
- Computer Assisted Instruction (A specialized form of mediated instruction relying primarily on student access to information and prepared lessons or teaching materials through a computer terminal, but not under immediate supervision of a qualified instructor.)

**GRADING POLICY AND STANDARDS** (include methods of determining whether the stated objectives have been met by students):

Grades are determined by scores received on exams and laboratory work according to the following plan:

Two or more exams	20 - 40%
Final exam	20 - 40%
Other	0 - 30%
Lab	20%

An insufficient performance in lab may result in effectively lowering the course grade by more than 20%. Exams are principally composed of physics problems that require quantitative solutions.

**IS COURSE REPEATABLE FOR REASON(S) OTHER THAN DEFICIENT GRADE?**

Yes  No  Number of times course may be taken for credit: 1

If yes, identify specific provision of Title 5 Division 2 section(s), 55761-55763 and 58161 which qualifies course as repeatable:

**CONTACT PERSON:** Takashi Nakajima

SIGNATURES ON FILE
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