

College of San Mateo

Course Outline

- New Course
 Update/No change
 Course Revision (Minor)
 Course Revision (Major)

Date:

Department: Physics Number: 101

Course Title: Conceptual Physics Lab Units: 1.0

Hours/Week: Lecture: Lab: 3 By Arrangement:

Length of Course

- Semester-long
 Short course (Number of weeks ___)
 Open entry/Open exit

Grading

- Letter
 Credit/No Credit
 Grade Option (letter or Credit/No Credit)

1. Prerequisite (Attach Enrollment Limitation Validation Form.)

Math 110 or equivalent.

2. Corequisite (Attach Enrollment Limitation Validation Form.)

Concurrent enrollment or passing grade in Physics 100 or equivalent

3. Recommended Preparation (Attach Enrollment Validation Form.)

4. Catalog Description (Include prerequisites/corequisites/recommended preparation.)

In this laboratory course, students will become familiar with the basic laws of physics by semi-quantitative experiments. Prerequisite: Math 110 or equivalent. Corequisite: concurrent enrollment or passing grade in Physics 100 or equivalent.

5. Class Schedule Description (Include prerequisites/corequisites/recommended preparation.)

Introductory lab experiments in mechanics, thermodynamics, electromagnetism, and optics. Prerequisite: Math 110 or equivalent. Corequisite: concurrent enrollment or passing grade in Physics 100 or equivalent.

6. Student Learning Outcomes (Identify 1-6 expected learner outcomes using active verbs.)

Upon successful completion of the course, the student will be able to:

Identify and understand Newton's Laws of Mechanics, thermal and electromagnetic properties of matter, and basic laws of optics by setting up and conducting experiments.

7. Course Objectives (Identify specific teaching objectives detailing course content and activities. *For some courses, the course objectives will be the same as the student learning outcomes. If*

this is the case, please simply indicate this in this section).

The same as 6.

8. **Course Content** (Brief but complete topical outline of the course that includes major subject areas [1-2 pages]. Should reflect all course objectives listed above. In addition, you may attach a sample course syllabus with a timeline.)

This course consists of a selection of about 15 experiments from the following list (with experiments at the semi-quantitative level) in conceptual physics. The student performs experiments, following a lab manual, that demonstrate basic laws of mechanics, thermodynamic, electromagnetism, and optics. The following is the list of the experiments:

- 1) Black Box experiment --- demonstrates the scientific method.
- 2) Basic measurements---familiarity with scientific measurements and measuring tools.
- 3) Blind as a bat---graphical analysis of motion.
- 4) Split second--- accelerated motion.
- 5) On the target---projectile motion.
- 6) Balancing act---Newton's first law.
- 7) Leverage and mechanical advantage--- torque and rotation.
- 8) Ballistic Pendulum---energy and momentum.
- 9) By Hooke and Crook--- elasticity.
- 10) Specific heats.
- 11) Cold stuff---Specific and latent heat.
- 12) Heat conduction.
- 13) Solar equality--- Inverse square law.
- 14) Ohm Sweet Ohm---Electric current.
- 15) Voltage divider---Ohm's Law
- 16) Cranking up---electric power.
- 17) Motors and generators.
- 18) Pinhole image formation.
- 19) Real and virtual images.
- 20) Spectrum of the elements.

These and other assigned activities, such as in class demonstrations, are designed to give the student basic understanding of the laws of physics.

9. **Representative Instructional Methods** (Describe instructor-initiated teaching strategies that will assist students in meeting course objectives. Include examples of out-of-class assignments, required reading and writing assignments, and methods for teaching critical thinking skills.)

Students will set up experiments , following a lab manual and instructor's supervision, collect and analyze data

10. **Representative Methods of Evaluation** (Describe measurement of student progress toward course objectives. Courses with required writing component and/or problem-solving emphasis must reflect critical thinking component. If skills class, then applied skills.)

The evaluation is based on the written lab reports generated by the student.

11. **Representative Text Materials** (With few exceptions, texts need to be current. Include publication dates.)

Conceptual Physics Lab. Manual, 10th ed. by Paul Robinson 2005

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(Signature)

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Submission Date: _____