College of San Mateo
Course Outline

☐ New Course
☐ Update/No change
☒ Course Revision (Minor)
☐ Course Revision (Major)

Date: 14 Nov 2010

Department: **Physics** **Number:** **150**

Course Title: **Preparation for Physics** **Units:** **4.0**

Total Semester Hours **Lecture: 48** **Lab:** 48 **Homework:** 80 **By Arrangement: 16**

Length of Course

- ☒ Semester-long
- ☐ Short course (Number of weeks___)
- ☐ Open entry/Open exit

Grading

- ☐ Letter
- ☒ Pass/No Pass
- ☐ Grade Option (letter or Pass/No Pass)

Faculty Load Credit (To be completed by Division Office; show calculations.)**:**

Lecture = 3*16/16 = 3 Lab = 0.8 * 48/16 = 2.4 Total = 5.4

1. **Prerequisite** (Attach Enrollment Limitation Validation Form.)

Completion of or concurrent enrollment in MATH 130 OR appropriate score on the College Placement Test and other measures as appropriate.

2. **Corequisite** (Attach Enrollment Limitation Validation Form.)

3. **Recommended Preparation** (Attach Enrollment Validation Form.)

4. **Catalog Description** (Include prerequisites/corequisites/recommended preparation. For format, please see model course outline.)

(Pass/No Pass grading.) Minimum of forty-eight lecture and forty-eight lab hours plus sixteen hours by arrangement per term. Prerequisite: completion of or concurrent enrollment in MATH 130 OR appropriate score on the College Placement Test and other measures as appropriate. **Focuses on review of algebra and trigonometry required for physics; problem solving; study skills; and description of motion. Designed for students planning to take PHYS 210 or 250. (AA)**

5. **Class Schedule Description** (Include prerequisites/corequisites/recommended preparation. For format, please see model course outline.)

Preparation for Physics 210 or 250. Math review, problem solving, study skills, and description of motion. Plus minimum 16 hours by arrangement per term. Prerequisite:

completion of or concurrent enrollment in MATH 130 OR appropriate score on the College Placement Test and other measures as appropriate. **Pass/No Pass grading.**

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:

Solve symbolic algebra equations and systems of equations for specified variables.

Create and analyze scientific graphs with appropriate accuracy.

Solve problems which require vector addition.

Analyze graphs of position, velocity and acceleration and answer qualitative and quantitative questions using the graphs.

Set-up and solve kinematics problems.

Collect and analyze data to verify physical principles.

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. In this case, "Same as Student Learning Outcomes" is appropriate here.)*

"same as student learning outcomes"

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, a sample course syllabus with timeline may be attached.)

Study Skills for Science Classes

Pre Algebra Review - Exponents; Roots; Scientific Notation; Logarithmic and Exponential Functions

Basic Lab Skills - Units and Unit Conversion; Measurement and Measuring Instruments; Physical Intuition; Definitions of Position, Displacement, and Instantaneous and Average Values of Speed, Velocity and Acceleration

Algebra - Review of Intermediate Algebra with a focus on Symbolic Algebra

Graphing - Review of Mathematical Graphs; Creating Scientific Graphs; Reading Points off of Graphs; Determining Equations of Lines; Performing Experiments to gather and graph data to observe or determine a relationship between physical quantities; Interpreting the Slope and Intercept of Scientific Graphs

Problem Solving - Translating Sentences into Mathematical Equations; Visualization Techniques for Word Problems; Set-Up of Word Problems

Vectors, Trigonometry and Geometry Review - Problem Solving Involving Geometric Formulas; Trigonometry Review with Focus on Right Triangles; Experimental Addition of Vectors using displacements walked by the students; Scale Diagram Vector Addition; Laboratory and Non-Laboratory Exercises involving Resolving Vectors into Components;

Determining Magnitude and Direction of a Vector given its Components; Graphical Addition of Vectors; Addition of Vectors by Components; Comparison between Component Addition of Vectors and Experimental Addition of Vectors

Kinematics - Laboratory Exercises involving generating, interpreting, and performing calculations using graphs of Position, Velocity and Acceleration as functions of Time; Qualitative and Quantitative Analysis of Position, Velocity and Acceleration Graphs; Kinematics Problem Solving using the definitions of the kinematic variables and the equations of motion for motion with a constant acceleration.

9. **Representative Instructional Methods** (Describe instructor-initiated teaching strategies that will assist students in meeting course objectives. Describe out-of-class assignments, required reading and writing assignments, and methods for teaching critical thinking skills. **If hours by arrangement are required, please indicate the additional instructional activity which will be provided during these hours, where the activity will take place, and how the activity will be supervised.**)

Lecture - traditional and interactive
Collaborative learning
Traditional and computer-based laboratory activities

Out-of-class assignments: Students will need to complete assigned homework problems as well as answering questions related to laboratory assignments.

Reading assignments will be from the text.

Writing assignments will include responding to short answer questions on laboratory assignments.

One area of focus will be on developing good problem solving skills; this requires and develops critical thinking skills.

Hours by arrangement may include:
Completing additional laboratory assignments in the Integrated Science Center or in a lab room with the instructor. Guided problem solving sessions with the instructor. Meeting with the instructor to go over mistakes on exams that are not passed on the first attempt to insure that students are able to progress in the course
Second and third attempts on Mastery Test sections (see "Representative Methods of Evaluation")

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.)

Physics 150 is a Pass/No-Pass Course. Passing the Course Requires Completion of Homework Assignments, Completion of Laboratory Exercises, Passing of All Sections of Mastery Tests and Passing a Comprehensive Final. Students are given three chances to pass each section of the mastery tests; passing requires 75% on each section. There are a total of 12 sections on the mastery tests: Exponents, Roots and Radicals, Algebraic Equations, Exponential and Logarithmic Functions, Scientific Notation and Significant Figures, Basic Calculations and Unit Conversions, Systems of Algebraic Equations, Mathematical Graphs, Scientific Graphs, Trigonometry and Vectors, Kinematics Graphs, and Kinematics Problems. Students are required to score 75% on the comprehensive final to pass the course.

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

Preparation For Physics Text, CSM 2010

Prepared by: _____
(Signature)

Email address: **locke@smccd.edu**

Submission Date: 15 Nov 2010