College of San Mateo
Official Course Outline

1. **COURSE ID:** PHYS 101 **TITLE:** Conceptual Physics Lab
   Units: 1.0 units **Hours/Semester:** 48.0-54.0 Lab hours
   Method of Grading: Letter Grade Only
   Prerequisite: MATH 110, or equivalent, and Completion of or concurrent enrollment in PHYS 100

2. **COURSE DESIGNATION:**
   Degree Credit
   Transfer credit: CSU; UC

3. **COURSE DESCRIPTIONS:**
   Catalog Description:
   Observation and testing of basic laws of physics through hands-on and video analysis experiments.

4. **STUDENT LEARNING OUTCOME(S) (SLO'S):**
   Upon successful completion of this course, a student will meet the following outcomes:
   1. Identify and describe the role of physical laws in observed phenomena.
   2. Communicate effectively using scientific terminology.
   3. Employ the scientific method to investigate physical phenomenon.

5. **SPECIFIC INSTRUCTIONAL OBJECTIVES:**
   Upon successful completion of this course, a student will be able to:
   1. Identify and describe the role of physical laws in observed phenomena.
   2. Communicate effectively using scientific terminology.
   3. Employ the scientific method to investigate physical phenomenon.

6. **COURSE CONTENT:**
   Lab Content:
   Students will complete approximately 16 experiments. Experiments will be a mixture of hands-on labs and video analysis labs in Mechanics, Thermodynamics, Electricity and Magnetism, and Optics. Experiments will be taken from all four categories below.

   Mechanics may include:
   - Measurement
   - Motion in One Dimension
   - Motion in Two Dimensions
   - Newton's Laws of Motion
   - Friction
   - Circular Motion
   - Energy Conservation
   - Momentum Conservation
   - Buoyancy and Archimedes's Principle

   Thermodynamics may include:
   - Gas Laws
   - Latent and Specific Heat
   - Laws of Thermodynamics

   Electricity and Magnetism may include:
   - Electric Charge and Force
   - Ohm's Law
   - Magnetic Force and Field
   - Magnetic Induction

   Optics may include:
   - Reflection and Refraction
   - Ray Tracing and Images
   - Color
   - Sources of Light

7. **REPRESENTATIVE METHODS OF INSTRUCTION:**

Typical methods of instruction may include:
A. Lab
B. Discussion
C. Experiments

8. **REPRESENTATIVE ASSIGNMENTS**
Representative assignments in this course may include, but are not limited to the following:
Writing Assignments:
As part of the laboratory exercises, students will answer short answer questions and summarize their findings.

9. **REPRESENTATIVE METHODS OF EVALUATION**
Representative methods of evaluation may include:
A. Class Participation
B. Group Projects
C. Lab Activities

10. **REPRESENTATIVE TEXT(S):**
Other:
A. Lab Exercises written by CSM Physics Department.
B. eScience Labs Introductory Physics Customizable Lab Kit (includes digital lab manual)

Origination Date: November 2015
Curriculum Committee Approval Date: December 2015
Effective Term: Fall 2016
Course Originator: David Locke