Community College System
University of Hawaii
Maui Community College

COURSE OUTLINE FORM

Course Alpha	:	PHYS 50
Course Name	:	Technical Physics
Course Description	:	Introduces principles of mechanics and properties of matter, heat, sound, electricity, magnetism, and light. Also introduces methods of measurement using both mechanical and electrical instruments. Emphasizes practical applications of physical principles.
Semester Units	:	3
Hours per Week	:	3 hours lecture
Purposes and Standards	:	Associate Degree Requirement, Automotive Technology Program. Elective for other vocational programs.
Prerequisites	:	MATH 1BCDE or satisfactory score on Math placement exam.
Date	:	February 12, 1994
Instructor Signature	:	John Pye

1. **COURSE OBJECTIVES:**

To provide students with an introduction to the basic theories and applications of physical principles as they relate to the vocational program curriculum. The emphasis of this course is on applications to automotive technology, to fulfill the requirements of the Automotive Technology Program. To give students a working knowledge of the physical principles encountered to assist in their learning throughout their vocational program coursework.

2. **GENERAL EDUCATION AND RELATIONSHIP TO OTHER COURSES:**

This course fulfills the physics requirement for the Associate Degree in the Automotive Technology Program. It may also be applied towards degree requirements in the other vocational programs. This course prepares students to better learn and apply physical concepts as they are encountered in their vocational/educational curriculum.

3. **TEXT AND MATERIALS:**

Hands-On Applied Physics by Aaron McAlexander

4. **REFERENCE MATERIALS:**

There are numerous other textbooks available in the Library and in the instructor's office. There are also several reference manuals available from the instructor.

5. **AUXILIARY MATERIAL AND CONTENT:**

Extensive handouts are provided to the students. Slides, videos, overhead transparencies, and demonstration equipment and apparatus are used to illustrate concepts throughout the course. Extensive use of laboratory equipment facilitates the "hands-on" learning approach of this course.

6. **METHODS OF INSTRUCTION:**

Lectures, discussion, and visual aids are used in this course. Students also participate in laboratory-type activities in which they can get practical experience in applying the concepts learned in the lectures. The course is divided into four units, and a review session and exam are given on each one.

7. **COURSE CONTENT:**

The course is divided into four units as follows:

Unit 1: Measurement Techniques and Graphical Analysis

1. Physical quantities and units
2. The micrometer and vernier caliper
3. Specific gravity
4. Graphing techniques
5. Functional relationships
6. Applications

Unit 2: Electricity and Magnetism

1. Introduction to electricity
2. Electric circuits
3. Magnetism
4. Alternating current
5. Electrical instruments
6. Electrical systems
7. Applications

Unit 3: Fluids and Thermodynamics

1. Properties of fluids
2. Archimedes' Principle and specific gravity
3. Pascal's Principle and hydraulics
4. Bernoulli's Principle and fluid dynamics
5. Heat and temperature
6. Thermal expansion
7. The states of matter and phase changes
8. Applications

Unit 4: Mechanics

1. Motion
2. Forces and torque
3. Work and power
4. Machines
5. Applications

8. EVALUATION:

Four exams are given in the course, one on each major unit covered. The exams consist of essay questions, multiple-choice questions stressing concepts, and problems involving applications of principles learned. The final grade in the course is determined by the total number of points accumulated. A percentage of the total is then calculated, and grades are determined by the following distribution:

A: 90-100% B: 80-89% C: 70-79% D: 55-69% N: <55%