JEFFERSON COLLEGE

COURSE SYLLABUS

PHY 118
INTRODUCTION TO PHYSICS

2 Credit Hours

Prepared by:
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PHY118: Introduction to Physics

I. CATALOGUE DESCRIPTION

A. Course Pre-requisites / Co-requisites:
MTH133 and MTH134, or MTH141

B. 2 semester credit hours

C. Introduction to Physics is the beginning course in the physics sequence for all physics, chemistry, mathematics and pre-engineering majors. In this course, students explore and develop mathematical models to describe and explain phenomena in the physical world. This course is required for the Associate of Science degree. Introduction to Physics also partially satisfies the science requirement for the Associate of Arts degree. (S)

II. EXPECTED LEARNING OUTCOMES/CORRESPONDING ASSESSMENT MEASURES

| Observe physical phenomena and seek patterns in data | Classroom discussions, homework, exams |
| Develop mathematical models to describe the observed patterns | Classroom discussions, homework, exams |
| Develop conceptual models to explain the observed patterns | Classroom discussions, homework, exams |
| Test their models and make refinements when necessary | Classroom discussions, homework, exams |
| Construct devices to measure data or to test applications of models | Classroom discussions, homework, exams, projects and performance assessment |

III. OUTLINE OF TOPICS

A. Introduction to mathematical modeling of physical data
   1. Empirical mathematical models
   2. The four major mathematical models via numeric sequences
   3. Mathematical modeling using real data

B. Vectors and the force model of static equilibrium
   1. Reference frames and coordinate systems
   2. Force vector model for static equilibrium problems

C. Physical and representational models
   1. Application of right-triangle trigonometry (e.g. scale of the Solar system)
   2. Graphical representation of the motion of objects
3. Model refinement process

D. Development and evaluation of scientific theory
   1. Design a simple measurement device (e.g. measure the sun’s elevation angle)
   2. Data analysis techniques and mathematical modeling
   3. Conceptual model, hypothesis and theory
   4. Measurement uncertainty and hypothesis testing

E. Sound waves and resonance models
   1. Sinusoidal standing wave model of resonance
   2. The “Wave in a Box” model of harmonic sequences
   3. Capstone experience (e.g. construct an accurate instrument based on data analysis)

IV. METHODS OF INSTRUCTION

A. Lecture
B. Classroom discussion
C. Homework
D. Guided analysis

V. REQUIRED TEXTBOOK

No textbooks required

VI. REQUIRED MATERIALS

No materials required

VII. SUPPLEMENTAL REFERENCES

No supplemental references required

VIII. METHOD OF EVALUATION

A. Graded homework (10 – 20%)
B. Examinations (50 – 60%)
C. Projects and Performance Assessment (10 – 30%)

IX. ADA-AA STATEMENT
Any student requiring special accommodations should inform the instructor and the Coordinator of Disability Support Services (Library phone 636-481-3169)

X. ACADEMIC HONESTY STATEMENT

All students are responsible for complying with campus policies as stated in the student handbook (see College website, http://www.jeffco.edu)

XI. ATTENDANCE STATEMENT

Students earn their financial aid by regularly attending and actively participating in their coursework. If a student does not actively participate, he/she may have to return financial aid funds. Consult the College Catalog or a Student Financial Services representative for more details.