COURSE IMPLEMENTATION DATE: April 1999
COURSE REVISED IMPLEMENTATION DATE: September 2006
COURSE TO BE REVIEWED: December 2009
(Four years after UPAC final approval date) (MONTH YEAR)

# OFFICIAL COURSE OUTLINE INFORMATION

Students are advised to keep course outlines in personal files for future use.
Shaded headings are subject to change at the discretion of the department and the material will vary - see course syllabus available from instructor

FACULTY/DEPARTMENT: **Faculty of Science, Health & Human Services / Physics**

| **PHYSICS 083** | | **4** |
|---|---|---|
| COURSE NAME/NUMBER | FORMER COURSE NUMBER | UCFV CREDITS |

**Preparatory College Physics I**
COURSE DESCRIPTIVE TITLE

## CALENDAR DESCRIPTION:

This is a college preparatory course equivalent to the Physics 11 course taught in B.C.'s high schools. Successful completion of this course provides the prerequisites to enroll in Phys 101 at UCFV. No prior knowledge of physics is needed or supposed, but it would be advisable to have passed Math 11 (or principles of Math 11) or Math 085 before enrolling in Phys 083.

This course covers the main concepts in mechanics and optics. In mechanics the topics studied are kinematics, vectors, Newton's laws, translational motion with applied forces, centripetal force, energy, work, and momentum. In optics the topics covered are: properties of light, reflection, image formation from plane mirrors, and spherical mirrors, refraction, image formation from convex and concave lenses, diffraction, and models of light.

A large number of experiments will be assigned to provide correlation between the classroom theory and practical applications.

PREREQUISITES: **Any BC Math 11 or Math 084 or Math 085**
COREQUISITES:

SYNONYMOUS COURSE(S)
(a) Replaces: **n/a** *(Course #)*
(b) Cannot take: **Phys 100** *(Course #)* for further credit.

SERVICE COURSE TO:
*(Department/Program)*
*(Department/Program)*

TOTAL HOURS PER TERM: **90**
STRUCTURE OF HOURS:

| | | |
|---|---|---|
| Lectures: | **45** | Hrs |
| Seminar: | | Hrs |
| Laboratory: | **45** | Hrs |
| Field Experience: | | Hrs |
| Student Directed Learning: | | Hrs |
| Other (Specify): | | Hrs |

TRAINING DAY-BASED INSTRUCTION
LENGTH OF COURSE:
HOURS PER DAY:

MAXIMUM ENROLLMENT: **24**
EXPECTED FREQUENCY OF COURSE OFFERINGS: **Once per year**

| | | |
|---|---|---|
| WILL TRANSFER CREDIT BE REQUESTED? (lower-level courses only) | ☒ Yes | ☐ No |
| WILL TRANSFER CREDIT BE REQUESTED? (upper-level requested by department) | ☐ Yes | ☐ No |
| TRANSFER CREDIT EXISTS IN BCCAT TRANSFER GUIDE: | ☒ Yes | ☐ No |

AUTHORIZATION SIGNATURES:

Course Designer(s): George McGuire Revised by: Norm Taylor
Chairperson: Gillian Mimmack *(Curriculum Committee)*

Department Head: Norm Taylor
Dean: Jackie Snodgrass

UPAC Approval in Principle Date:
UPAC Final Approval Date: December 14, 2005

**LEARNING OBJECTIVES / GOALS / OUTCOMES / LEARNING OUTCOMES:**

After successfully finishing this course the students should be able to:

1. Discuss and understand the basic ideas of 1-dimensional kinematics and conservation of momentum and energy, and also physical optics.
2. Apply the principle of physics to explain their physical environment
3. Gather and analyze data in a lab report
4. Solve various problems in each of the topic areas listed in the Calendar Description section;
5. Become acquainted with the scientific methods of physics
6. More realistically assess their chance for a successful career in a science related field, or some branch of the technologies.

**METHODS:**

1. The course will be presented using a variety of techniques: classroom lectures; laboratory experiments; activities; films; and demonstrations.
2. Close coordination will be maintained between the theoretical and laboratory work.
3. Weekly assignments will be used to evaluate the rate of learning and the depth of the student's comprehension.
4. At least half of the classroom time will be spent on laboratory related activities.
5. The experiments will be used to interact with the students on a more personal and intimate level. This time can be used to give individual help.
6. The periods are 3.0 hours long, with two periods per week, and one break of twenty minutes is given after the instructional time. In this way, students will begin their labs at different intervals and this makes individual help much easier to obtain.

**PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):**

Credit can be awarded for this course through PLAR (Please check:) ☒ Yes ☐ No

**METHODS OF OBTAINING PLAR:**

Departmental Review and/or Course Challenge

**TEXTBOOKS, REFERENCES, MATERIALS:**

[Textbook selection varies by instructor. An example of texts for this course might be:]

Fundamentals of Physics, D.C. Heath, 1993

**SUPPLIES / MATERIALS:**

Fully-equipped physics lab

**STUDENT EVALUATION:**

[An example of student evaluation for this course might be:]

| | |
|---|---|
| Assignments | 20% |
| Experiments and Activities | 10% |
| Quizzes | 10% |
| Midterm Exam | 20% |
| Final Exam | 40% |

**COURSE CONTENT:**

[Course content varies by instructor. An example of course content might be:]

Major concepts: Mechanics and Optics

A. Part 1: Kinematics and Dynamics

1. Introduction
   a. Measurement
   b. Unit systems
   c. Mathematics with powers of ten
   d. Prefixes

2. Collecting Data, Analysis of Data, and Graphing
   a. Common Graph shapes and their analysis
   b. Presenting data tables
   c. The making of some easy kinematic graphs
   d. Slopes

3. Kinematics
   a. Analysis of position (x) vs. time (t) graphs
   b. Analysis of speed (v) vs time (t) graphs
   c. Develop the kinematic equations
   d. Using the three standard kinematic equations

4. Vectors (Graphical Method Only)
   a. Drawing and Labelling
   b. Addition
   c. Subtraction
   d. Relative velocities
   e. Subtraction
   f. Circular motion (graphical)

5. Dynamics and Kinematics
   a. Newton's Laws
   b. Translational Motion with applied forces
   c. Centripetal Force

6. Conservation Laws (1 Dimension only)
   a. Energy and Work
   b. Momentum

B. Part 2: Optics

7. Light
   a. Properties
   b. Historical Significance

8. Reflection and Image Formation

a. Laws of Reflection
b. Plane Mirrors
c. Parabolic Mirrors

9. Refraction and Image Formation
a. Snell's Law
b. Convex Lenses
c. Concave Lenses
d. Colour

10. Diffraction and Interference (optional)
a. Adding Waves
b. Two slit diffraction
c. Single slit diffraction
d. Parallel Plate Interference

11. Models of Light (optional)
a. Particle Model
b. Wave Model