UNIVERSITY OF THE FRASER VALLEY

OFFICIAL COURSE OUTLINE (page 1)

COURSE IMPLEMENTATION DATE:	April 1999
COURSE REVISED IMPLEMENTATION DATE:	September 2009
COURSE TO BE REVIEWED:	February 2013
(four years after UPAC approval)	*(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 – see course syllabus available from instructor

PHYS 083	Physics	4
COURSE NAME/NUMBER	FACULTY/DEPARTMENT	UCFV CREDITS

Preparatory University Physics I

COURSE DESCRIPTIVE TITLE

CALENDAR DESCRIPTION:

This is a university preparatory course equivalent to the Physics 11 course taught in BC high schools. Successful completion of this course provides the prerequisites to enroll in PHYS 101 at UFV. No prior knowledge of physics is needed.

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:

COREQUISITES:

PRE or COREQUISITES: MATH 085 or Principles of Math 11. (Note: students currently enrolled in Principles of Math 11 can contact the instructor to request permission to register.)

SYNONYMOUS COURSE(S):

(a) Replaces: **N/A**

(b) Cross-listed with:

(c) Cannot take: **PHYS 100** for further credit.

SERVICE COURSE TO: *(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:

OTHER:

Maximum enrolment: **24**

Expected frequency of course offerings: once per year

(every semester, annually, every other year, etc.)

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

Course designer(s):	**George McGuire**		
Department Head:	**Norm Taylor**	Date approved:	**November 26, 2007**
Supporting area consultation (UPACA1)		Date of meeting:	**October 31, 2008**
Curriculum Committee chair:	**Norm Taylor**	Date approved:	**January 9, 2009**
Dean/Associate VP:	**Dan Ryan**	Date approved:	**January 22, 2009**
Undergraduate Program Advisory Committee (UPAC) approval		Date of meeting:	**February 27, 2009**

LEARNING OUTCOMES:

Upon successful completion of this course, students will 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: *(Guest lecturers, presentations, online instruction, field trips, etc.)*

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.

METHODS OF OBTAINING PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):

☒ Examination(s) ☐ Portfolio assessment ☐ Interview(s)

☒ Other (specify): Evidence of having appropriate laboratory skills

☐ PLAR cannot be awarded for this course for the following reason(s):

TEXTBOOKS, REFERENCES, MATERIALS:

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

Fundamentals of Physics, D.C. Heath, 1993
Introductory Physics, Building Understanding, J. Touger, 2006

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. 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