UNIVERSITY OF THE FRASER VALLEY

OFFICIAL COURSE OUTLINE (page 1)

COURSE IMPLEMENTATION DATE:	Fall 1993
COURSE REVISED IMPLEMENTATION DATE:	January 2010
COURSE TO BE REVIEWED:	October 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 112	Physics	5
COURSE NAME/NUMBER	FACULTY/DEPARTMENT	UCFV CREDITS

Electricity and Magnetism

COURSE DESCRIPTIVE TITLE

CALENDAR DESCRIPTION:

The course follows PHYS 111 and is designed for students who are planning to continue their studies in physics or any of the other sciences. Topics include electric fields, Gauss's law, electric potential, circuits, Kirchhoff's laws, magnetic fields, magnetic induction, and finally, a study of Maxwell's equations. The laboratory portion of the course uses experiments to reinforce the theory covered in class.

PREREQUISITES:	PHYS 111 or (PHYS 101 with a B+, MATH 112 recommended) or (PHYS 101 and 105, MATH 112 recommended)
COREQUISITES:	
PRE or COREQUISITES:	MATH 112

SYNONYMOUS COURSE(S):

(a) Replaces:

(b) Cross-listed with:

(c) Cannot take: for further credit.

SERVICE COURSE TO: *(department/program)*

TOTAL HOURS PER TERM: **120**

STRUCTURE OF HOURS:

Lectures:	**75**	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: **36**

Expected frequency of course offerings: Yearly

(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):	**Tim Cooper**		
Department Head:	**Norm Taylor**	Date approved:	**May 11, 2009**
Supporting area consultation (UPACA1)		Date of meeting:	**May 22, 2009**
Curriculum Committee chair:	**Norm Taylor**	Date approved:	**May 29, 2009**
Dean/Associate VP:	**Dan Ryan**	Date approved:	**October 6, 2009**
Undergraduate Program Advisory Committee (UPAC) approval		Date of meeting:	**October 30, 2009**

LEARNING OUTCOMES:

Upon successful completion of this course, students will be able to:

- understand the fundamental laws of electricity and magnetism, and learn how to apply the theory to solve related problems
- apply physics to everyday situations and phenomena in engineering, physical sciences, and life sciences
- use and investigate modern apparatus, perform fundamental laboratory experiments, and interpret data obtained
- develop a feeling for the order of magnitude of physical quantities in real experiments
- emphasis will be placed on assigning problems which require the student to use calculus in their solutions

METHODS: *(Guest lecturers, presentations, online instruction, field trips, etc.)*

This course will be presented using lectures and laboratory experiments. Films or other audio-visual aids may be used where appropriate. Problems will be assigned on a regular basis which are to be handed in and marked. Problems that require the use of calculus will be emphasized. Close coordination will be maintained between laboratory and classroom work. Computer-assisted learning programs will be used to increase the understanding of the concepts being studied.

METHODS OF OBTAINING PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):

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

☒ Other (specify): Evidence of skill equivalent to the lab part of the course

☐ 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:]

Young and Freedman, *University Physics*, 12th ed. (UFV edition), Pearson, 2008

References:

F. Beuche, *Introduction to Physics for Scientists and Engineers,* 3rd ed., McGraw-Hill, 1980
F. Sears & M. Zemansky, *University Physics*, 5th ed., Addison Wesley, 1979
R. Serway, *Physics for Scientists and Engineers*, Holt, Rinehart and Winston, 1993
Halliday/Resnick/Walker, *Fundamentals of Physics*, 6th edition extended, John Wiley & Sons, Toronto, 2000

SUPPLIES / MATERIALS:

STUDENT EVALUATION:

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

Assignments	10%
Midterm	20%
Laboratory work	15%
Final exam	45%
Quizzes	10%

COURSE CONTENT:

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

1. Coulomb's Law, electric field, potential, capacitance, Gauss' Law
2. electric current, electromotive force, Ohm's Law, Joule's Law, Kirchhoff's Laws, RC time constant
3. magnetic field, currents, force on a moving charge
4. sources of magnetic field, Bio Savart Law, Ampere's Law, and production of B fields
5. magnetic induction, induction, induced emf, Faraday's Law, Lenz's Law, mutual inductance, energy in a magnetic field
6. Maxwell's Equations, E and B waves, energy in E/m waves
7. introduction to time varying electric and magnetic fields and behaviour of AC circuits