UNIVERSITY COLLEGE of the FRASER VALLEY

COURSE IMPLEMENTATION DATE:[Fall 1993
COURSE REVISED IMPLEMENTATION DATE:[September 2002
COURSE TO BE REVIEWED:[September 2006]
(Four years after implementation date)

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 material will vary - see course syllabus available from instructor

FACULTY/DEPARTMENT: PHYSICS

PHYS 112		4
COURSE NAME/NUMBER	FORMER COURSE NUMBER	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 101 with a B+ or better, or PHYS 111

PRE or COREQUISITES: MATH 112

SYNONYMOUS COURSE(S)
(a) Replaces: N/A
(Course #)
(b) Cannot take N/A for further credit
(Course #)

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

TOTAL HOURS PER TERM: 73

STRUCTURE OF HOURS:

Lectures:	43	hrs
Seminar:		hrs
Laboratory:	30	hrs
Field Experience:		hrs
Student Directed Learning:		hrs
Other (Specify):		hrs

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

MAXIMUM ENROLMENT: 36

EXPECTED FREQUENCY OF COURSE OFFERING: Yearly

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** X **NO**

AUTHORIZATION SIGNATURES:

Course designer(s): Peter Mulhern
Chairperson: *(Curriculum Committee)*
Department Head: Peter Mulhern
Dean: J. Snodgrass
PAC Approval in Principle Date:
PAC Final Approval Date: December 14, 2001

LEARNING OBJECTIVES / GOALS / OUTCOMES/ LEARNING OUTCOMES:

Students who enroll in this course have completed Physics 111 and Math 111 (Calculus) or their equivalents. The course is intended for students who are planning to study engineering, science, and life sciences. Students will be able to:

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

METHODS:

This course will be presented using lectures and laboratory experiments. Films or other audio-visual aids will 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.

PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):

Credit can be awarded for this course through PLAR YES _____ NO ___X___

METHODS OF OBTAINING PLAR:

If a student can show evidence of skill equivalent to the lab part of the course, we are willing to consider that plus successful completion of a final exam as equivalent to the course.

TEXTBOOKS, REFERENCES, MATERIALS:

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

Halliday/Resnick/Walker, *Fundamentals of Physics*, 6th edition extended, John Wiley & Sons, Toronto, 2000

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

SUPPLIES / MATERIALS:

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

Assignments	20%
Midterm	25%
Laboratory work	15%
Final exam	40%

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, Ampere's Law, production of B fields, B of long straight wire
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