



School of Arts & Science
PHYSICS DEPARTMENT
PHYS 210
Electricity and Magnetism
2007W

COURSE OUTLINE

The Approved Course Description is available on the web @ _____

Ω Please note: this outline will be electronically stored for five (5) years only.
It is strongly recommended students keep this outline for your records.

1. Instructor Information

(a)	Instructor:	Ed Nelson		
(b)	Office Hours:	MTThF 11:30 – 12:20, W 12:30 – 1:20		
(c)	Location:	F314D		
(d)	Phone:	370-3515	Alternative Phone:	
(e)	Email:	nelson@camosun.bc.ca		
(f)	Website:			

2. Intended Learning Outcomes

(No changes are to be made to this section, unless the Approved Course Description has been forwarded through EDCO for approval.)

Upon completion of this course the student will be able to:

1. Provide and define the fundamental properties of the electric charge, solve technical problems associated with the electrostatic force (Coulomb force), the electric force field, Gauss's Law, the electric potential and potential difference, within a framework of distributed symmetric charge distributions, using calculus.
2. Define electric capacitance and solve technical problems associated with capacitors of various symmetries, capacitors in series and parallel combination, the microscopic effect of dielectric materials on capacitance and stored energy.
3. Define electric current, current density, and solve technical problems involving DC networks of resistors, batteries, and capacitors, Ohm's Law, Kirchhoff's Laws, and RC charging and decay circuits.
4. Define the magnetic field and magnetic flux, solve technical problems associated with the effect of static, non-uniform and uniform magnetic fields on moving charges and current-carrying wires, loops and the magnetic dipole.
5. Calculate the magnitude and direction of the magnetic field for symmetric current distributions using the Law of Biot-Savart and Ampere's Law, and state the limitations of Ampere's Law.
6. State Faraday's Law of Induction with Lenz's Law and use these equations to solve technical problems associated with induction.
7. Calculate inductance according to the fundamental definition, solve technical problems associated with LR circuits and coils, and calculate the stored energy in magnetic fields.

8. Solve technical problems involving electromagnetic oscillations and AC, including phasor diagrams, free, damped and forced oscillations, resonance, RMS current, voltage and power, LC oscillators, LRC circuits, and the transformer.
9. Quote the four Maxwell's equations, define all the terms, and demonstrate knowledge of the historical background leading to their development, with particular attention to the concept of the displacement current.

3. Required Materials

See Below

(a)	Texts	
(b)	Other	

4. Course Content and Schedule

(Can include: class hours, lab hours, out of class requirements and/or dates for quizzes, exams, lectures, labs, seminars, practicums, etc.)

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5. Basis of Student Assessment (Weighting)

(Should be linked directly to learning outcomes.)

See Below

(a)	Assignments	
(b)	Quizzes	
(c)	Exams	
(d)	Other (eg, Attendance, Project, Group Work)	

6. Grading System

(No changes are to be made to this section, unless the Approved Course Description has been forwarded through EDCO for approval.)

Standard Grading System (GPA)

Percentage	Grade	Description	Grade Point Equivalency
95-100	A+		9
90-94	A		8
85-89	A-		7
80-84	B+		6
75-79	B		5
70-74	B-		4
65-69	C+		3
60-64	C		2
50-59	D		1
0-49	F	Minimum level has not been achieved.	0

Temporary Grades

Temporary grades are assigned for specific circumstances and will convert to a final grade according to the grading scheme being used in the course. See Grading

Policy at camosun.ca or information on conversion to final grades, and for additional information on student record and transcript notations.

Temporary Grade	Description
I	<i>Incomplete:</i> A temporary grade assigned when the requirements of a course have not yet been completed due to hardship or extenuating circumstances, such as illness or death in the family.
IP	<i>In progress:</i> A temporary grade assigned for courses that are designed to have an anticipated enrollment that extends beyond one term. No more than two IP grades will be assigned for the same course.
CW	<i>Compulsory Withdrawal:</i> A temporary grade assigned by a Dean when an instructor, after documenting the prescriptive strategies applied and consulting with peers, deems that a student is unsafe to self or others and must be removed from the lab, practicum, worksite, or field placement.

Temporary grades are assigned for specific circumstances and will convert to a final grade according to the grading scheme being used in the course. See Grading Policy E-1.5 at camosun.ca for information on conversion to final grades, and for additional information on student record and transcript notations.

7. Recommended Materials or Services to Assist Students to Succeed Throughout the Course

LEARNING SUPPORT AND SERVICES FOR STUDENTS

There are a variety of services available for students to assist them throughout their learning. This information is available in the College calendar, at Student Services or the College web site at camosun.ca.

STUDENT CONDUCT POLICY

There is a Student Conduct Policy **which includes plagiarism**. It is the student's responsibility to become familiar with the content of this policy. The policy is available in each School Administration Office, at Student Services and on the College web site in the Policy Section.

ADDITIONAL COMMENTS AS APPROPRIATE OR AS REQUIRED

Camosun College Physics Department

PHYS 210 Electricity and Magnetism

Instructor: Ed Nelson

Office: Fisher 314D

Phone: (370) 3515

email: nelson@camosun.bc.ca

Office Hours: Please see posted office schedule outside F 314D.

Consultation at more convenient times is always possible; if my office door is open, just come in.

Required Materials for this course:

1. Course Textbook: *Physics for Scientists and Engineers*, 5th or 6th Edition, Raymond A. Serway and John W. Jewett [Note: any good 1st year Physics textbook, such as Halliday, Resnick & Crane, Tipler, Ohanian, etc. will provide the same background material]
2. PHYS 210 Course Outline (provided) and information page
3. PHYS 210 Laboratory Manual
4. Laboratory Report Book/ Scientific Calculator/ Graph Paper/ Ruler

Evaluation:

- | | | |
|-----------------------|-------|-------------------------------------|
| 1. FINAL EXAM | 50% | |
| 2. Midterm exams (3) | 25% | (at equal intervals in the quarter) |
| 3. Laboratory reports | 15% | |
| 4. Project | 5% | |
| 5. Quizzes | 5% | |
| | <hr/> | |
| | 100% | |

NOTE #1: A passing mark in the laboratory reports is required to obtain credit in PHYS 210

NOTE#2: To go on in other Physics/Engineering courses, an overall grade of C or better must be achieved.

Letter Grade Scale:

A+	A	A-	B+	B	B-	C+	C	D	F
95-100%	90-95%	85-90%	80-85%	75-80%	70-75%	65-70%	60-65%	50-60%	<50%

FAQ about Physics 210

Is this going to be on the exam? I cannot tell you in advance what is going to be on any exam or quiz (but I will say that most of what you will encounter on exams will look a lot like assigned problems). *Everything in the course is testable material.*

What is going to be on the exam? I cannot tell you specifically what will be on any exam or quiz. The final exam and midterm exams will consist of three parts: word problems (answer in your own words), concept problems (a formula sheet/programmable calculator won't help you), and calculation problems. The midterm exams will test you on material covered since the previous exam. The final exam is cumulative.

Do we have to know this? Since you are responsible for learning all the material presented in this course, the answer is "yes" (unless I start rambling on in class about how I remotely rebooted all the computers in the UVic physics department, or how I single-handedly shut down the entire radio network for the City of Edmonton Fire Department).

How do I pass Physics 210? Your main objective should be to write an excellent final exam. Ask questions in class about anything that is not clear. Do at least 10 problems every week. Participate in class activities (they are designed to help you learn the material). Talk to your instructor about what works or doesn't work for you.

Is there a formula sheet? A formula page will be provided; however most students should have a graphing calculator which can store numerous formulae. This is not a course in memorization, so I do not expect you to remember a lot of algebraic results for specific problems. What you are expected to come away with in this course is an understanding of and skill in utilising only about half a dozen *major concepts*.