

DEPARTMENT OF PHYSICS AND ASTRONOMY

PHYS 4220H: Electromagnetic Theory 2012-2012 FA

Peterborough

Instructor: Aaron Slepkov	Email: aaronslepkov@trentu.ca	Telephone: x6216
Campus: Peterborough	Office Location: SC211	Office Hours: Tuesdays 10:00-11:00 AM and/or by appointment

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Course Description:

The goal of this course is primarily, starting from Maxwell's Equations, to develop the electromagnetic theory beyond static electric and magnetic systems to dynamic time varying systems. Topics covered are conservation laws; EM wave theory and propagation in vacuum and matter; waveguide theory; potentials, fields and radiation.

Material delivery

Time Period or Date	Торіс	Book Chapter	
WEEK 1	review of 3200Y + Maxwell's Equations	7.3	
WEEK 2	conservation laws; Poynting's Theorem	8.1	
WEEK 3	EM waves; waves in vacuum, energy and	9.1, 9.2	
	momentum;		
WEEK 4 & 5	waves in matter, transmission, reflection; 9.3, 9.4		
	absorption and dispersion		
WEEK 6 & 7	guided waves, resonant cavities	9.5	
October 21-29	Reading Week—NO CLASSES		
November 31, 12:00-14:00	Mid-Term	In Class	
WEEK 8 & 9	scalar and vector potentials; gauge	10.1	
	transformations		
WEEK 9 & 10	Retarded potentials from continuous	10.2, 10.3	
	distributions and moving point charges and		
	distributions and moving point charges and		
	fields from a moving point charge		
WEEK 10 & 11	fields from a moving point charge Radiation from oscillating dipoles and from	11.1, 11.2	
WEEK 10 & 11	distributions and moving point charges and fields from a moving point charge Radiation from oscillating dipoles and from moving point charges	11.1, 11.2	

Please note that this schedule is somewhat tentative and may change slightly to accommodate the needs of the class.

<u>Required Texts:</u> Introduction to Electrodynamics, by David J. Griffiths (3rd edition preferred)

Course Pre-requisites: PHYS 3200Y and PHYS-MATH 3150H

Course Format:

	Day	Time	Location
Lecture	MON	13:00-13:50	SC317
Seminar	MON	14:00-14:50	SC317
Lecture	WED	12:00-13:50	SC317

The seminar time will be used flexibly; for class reading, group discussion and added insight, to go through instructive example problems.

Course Evaluation:

Assignments: 45% Mid-Term Exam: 20% Final Exam: 35%

Roughly every two weeks, a problem set will be assigned with a well defined due date and time.

By the class drop-date of November 6, 2011, it is expected that you will know approximately 40% of your final grade. This includes the results of your mid-term exam and several assignments.

Late Policy: Late assignments will be deducted 15% total grade, regardless of the reason for lateness, unless arranged in advance of the due-date with the instructor. Late assignments will no longer be accepted for grading after one week of lateness, resulting in a grade of zero.

University Policies

Academic Integrity:

Academic dishonesty, which includes plagiarism and cheating, is an extremely serious academic offence and carries penalties varying from a 0 grade on an assignment to expulsion from the University. Definitions, penalties, and procedures for dealing with plagiarism and cheating are set out in Trent University's *Academic Integrity Policy*. You have a responsibility to educate yourself – unfamiliarity with the policy is not an excuse. You are strongly encouraged to visit Trent's Academic Integrity website to learn more: www.trentu.ca/academicintegrity.

Access to Instruction:

It is Trent University's intent to create an inclusive learning environment. If a student has a disability and/or health consideration and feels that he/she may need accommodations to succeed in this course, the student should contact the Disability Services Office (BH Suite 132, 748-1281, <u>disabilityservices@trentu.ca</u>) as soon as possible. Complete text can be found under Access to Instruction in the Academic Calendar.