



AMBROSE UNIVERSITY COLLEGE
PHY123-1 Introductory Electromagnetism and Thermal Physics
COURSE OUTLINE Winter 2012

PROFESSOR: Dr. Krishna Mukerji **Room: A 1085-1**
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COURSE DESCRIPTION

This course covers the areas of electric forces and circuits, Ohm's law, magnetic forces and thermal physics including gas law, energy transfer and thermodynamics.

OBJECTIVES: Physics 123-1 provides an introduction to thermodynamics and electromagnetism. Although presentation is at the non-calculus level, problem-solving is emphasized.

At the end of the course the students should be able to:

1. Understand and explain the basic concepts of fluid mechanics, and laws of thermodynamics and electricity and magnetism
2. Be able to apply the laws to particular problems

PREREQUISITE: Physics 111 Mechanics
LECTURE: **Wednesdays and Fridays 8:15 am to 9:30 am Room Number A 1085-1**

TUTORIAL: **Mondays 8:00 am to 10:00 am Room Number A 2151**

OFFICE HOURS: TBA

TEXT: **Physics, by Cutnell and Johnson 8ed. (John Wiley and Sons)**

TESTING:	Tutorials/Lab	15%
	Assignments	15%
	First Examination 1	15%
	Second Examination 2	15%
	Final Exam (3 hrs)	40%

ATTENDANCE: Students are expected to attend all classes for which they are registered. Unexcused absence may result in loss of marks. Unexcused absences may lead to penalty on the final grade. Where the student has been absent without permission or legitimate cause for more than one quarter of the classes, an instructor may bar a student from writing the final exam.

COURSE REQUIREMENTS: While students are encouraged to assist each other, each student must create her or his own original solution to assignments, quizzes and exams. Duplicate submissions will result in students involved receiving a zero for the submission.

ASSISTANCE: Your instructor will be available during class, during office hours, and other times by appointment.

IMPORTANT NOTES: It is the responsibility of all students to become familiar with and adhere to academic policies of as are stated in the Student Handbook and Academic Calendar.

Personal information, that is information about an individual that may be used to identify that individual, may be collected as a requirement as a part of taking this class. Any information collected will only be used and disclosed for the purpose for which the collection was intended. For further information contact the Privacy Compliance Officer at privacy@auc-nuc.ca.

Although extensions to course work in the semester are at the discretion of the instructor, students may not turn in coursework for evaluation after the last day of scheduled final examination period unless they have received permission for a “Course Extension.” Alternative times for final examination time must be submitted to the Registrar’s Office by the appropriate deadline. Course extension are only granted for serious issues that arise “due to circumstances beyond the student’s control”.

We are committed to fostering personal integrity and will not overlook breaches of integrity such as plagiarism and cheating. Plagiarism and cheating can result in a failing grade for an assignment, for the course, or immediate dismissal from the university collage. Students are expected to be familiar with the policies in the current Academic Calendar and the Student Handbook that deal with plagiarism, cheating, and the penalties and procedures, for dealing with these matters. All cases of academic dishonesty are reported to the Academic Dean.

Students are advised to retrain this syllabus for their records.

GRADING: Student grades are earned as follows:

[0-50]	F	Fail - unsatisfactory performance or failure to meet course requirements.
[50-55]	D	
[55-60]	D+	Minimum pass - marginal performance, generally insufficient preparation for subsequent courses in the same subject.
[60-63]	C-	
[63-67]	C	Satisfactory - basic understanding of the subject matter.
[67-70]	C+	
[70-75]	B-	
[75-80]	B	Good - clearly above average performance with knowledge of subject matter generally complete.
[80-85]	B+	
[85-90]	A-	
[90-95]	A	Excellent - superior performance, showing comprehensive understanding of the subject matter.
[95-100]	A+	

Note: In order to attain a final grade higher than a D, you must **ACHIEVE AT LEAST 50% ON THE FINAL**

IMPORTANT DATES:

HOLIDAYS (NO CLASS)

FIRST DAY OF CLASSES: Wed, January 11	COMMUNITY DAY: Thu, February 2
LAST DAY FOR WITHDRAWL AND RECEIVE TUTION REFUND: Sun, January 22	FAMILY DAY: Mon, February 20
LAST DAY FOR WITHDRAWL WITHOUT ACADEMID PENALTY: Fri, March 23	MID-SEMESTER BREAK: Tue, February 21 to Sat, February 25
LAST DAY OF CLASSES: Thu, April 12	GLOBAL IMPACT DAY: Wed, March 7
FINAL EXAM: Mon, April 16	GOOD FRIDAY: Fri, April 6

Phy 123 Tentative Schedule for Winter 2012

	Topics covered	C&J reference
Week 1 Jan 11-13	Density: Mass and volume. Pressure: definition, applications. Gravity & pressure: fundamentals, applications to measuring pressure.	11.1
Week 2 Jan 16--20	Gravity & pressure (continued): fundamentals, applications to measuring pressure. Pascal's principle: statement, applications. Archimedes' principle: derivation, applications.	11.2-11.5
Week 3 Jan 23-27	Archimedes' principle (continued): derivation, applications. Temperature: 0th Law of Thermodynamics, thermal equilibrium, definition of temperature and temperature scales. Internal energy and heat: definitions, mechanical equivalent of heat.	11.6 12.1-12.3
Week 4 Jan 30-Feb 3	Heat capacity: definition, specific heat, ideal gases. Molecular picture: definitions of mole, atomic mass unit. Ideal gas law: statement, applications.	12.6-12.7 14.1-14.2
Week 5 Feb 6-10	Zeroth and First Law of Thermodynamics: statement, sign conventions. Thermodynamic processes: isobaric, isochoric, isothermal, adiabatic.	15.1-15.5
Week 6 Feb 13-17	Specific Heat of Ideal gases: C_p and C_v . Second Law Thermodynamics: Reversible and Irreversible processes, and heat engines.	15.6-15.7 15.8-15.10
	First Examination - Friday, February 17	
Week 7 Feb 27-Mar2	Electric forces: charges, conductors and insulators, Coulomb's law.	18.1-18.5
Week 8 Feb 27Mar2	Electric field: field of point charges, motion of charges in uniform electric field. Electrostatic equilibrium: properties of conductors in ESE.	18.6-18.8
Week 9 Mar 5-9	Electric potential energy: potential energy and work, energy of two-charge and many-charge systems.	19.1-19.2
Week 10 Mar 12-16	Electric potential: potential energy and potential. Electric potential: equipotential surfaces and electric field lines.	19.1-19.3
Week 11 Mar 19-23	Electric potential (continued): conservation of energy for moving charges. Capacitance: definition, parallel-plate capacitor, applications. Dielectrics: effect on capacitance, microscopic picture. Energy in capacitors: work in charging capacitor, applications.	19.4 19.5-19.6
	Second Examination - Friday, March 30	
Week 12 Mar 26-30	Electric current: definition, examples. EMF: potential of battery, work by battery. Ohm's Law and Resistance: definitions, temperature dependence, power. Series and parallel circuits.	20.1-20.9
Week 13 Apr 2-6	Magnetic Fields and Forces	21.1-21.4 21.7
Week 14 Apr 9-11	Review	

Apr 16	<u>Final Exam</u>	
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Suggested Problems: All odd numbered **Focus on Concepts Questions** and **Problems** pertaining to the sections covered.
NOTE: You are reminded that this outline is a guideline prepared for your information. Exceptional circumstances may require modification to the outline.