PROFESSOR: Christopher Polachic   **Room: A2141**
Email: cpolachic@ambrose.edu

OBJECTIVES: Physics 123-1 provides an introduction to foundational concepts in thermal physics and electromagnetism. At the end of the course, students should have acquired a broad understanding of the essential physics and macroscopic laws describing:

      a. thermal properties of materials;
      b. electricity and magnetism in materials;
      c. electromagnetic waves.

Students should be able to apply their understanding of this essential physics to specific problems requiring both conceptual and mathematical solutions.

PREREQUISITE: Physics 111 Mechanics

CLASSROOM TIME: Thursdays 2:30-5:15   Room A2141

      The classroom time may combine lectures, problem-solving, and hands-on demonstrations in order to make the most of our schedule and provide a variety of ways to approach the content. We will also have a few experiments and/or tutorials requiring group work and the construction of a formal lab report. We will take short breaks, too, because 2:30 to 5:15 is a long time to think about *anything*, let alone physics.

      Some of the course material will also be provided through online content, such a video lectures, quizzes and worked problems. Students will be directed to this online content and will be responsible for understanding and applying it in quizzes, problem assignments and exams. In particular, students should expect lecture material for the last week of January to be made available online, in light of the Jan. 29 cancellation of classes.

OFFICE HOURS: For logistical reasons, the instructor is only reliably available for virtual office appointments, *i.e.* for online video conferencing throughout Monday to Friday by appointment at a mutually convenient time. During the first lecture students will be provided with contact details including a Google+ ID and cell number. Students are encouraged to use e-mail or text to arrange an appointment to meet via Google Hangouts.

TEXT: Physics, by Cutnell and Johnson 9th ed. (John Wiley & Sons)

GRADE ALLOCATION:

Online Quizzes (pass/fail)	10%
Problem Assignments	25%
Labs/Tutorials	15%
Midterm	15%
Final Exam	35%
TOTAL	**100%**

ATTENDANCE: Students are expected to attend all classes for which they are registered. Unexcused absence may result is 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, and other times online by appointment, and will endeavor to respond to e-mails and texts in a timely manner, under normal circumstances within twelve hours or less during weekdays.

IMPORTANT NOTES: It is the responsibility of all students to become familiar with and adhere to academic polices as 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 extensions 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. 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:

Range	Grade	Description
[0-50]	F	**Fail** - unsatisfactory performance or failure to meet course requirements.
[50-55]	D	**Minimum pass** - marginal performance, generally insufficient preparation for subsequent courses in the same subject.
[55-60]	D+	
[60-63]	C-	**Satisfactory** - basic understanding of the subject matter.
[63-67]	C	
[67-70]	C+	
[70-75]	B-	**Good** - clearly above average performance with knowledge of subject matter generally complete.
[75-80]	B	
[80-85]	B+	
[85-90]	A-	**Excellent** - superior performance, showing comprehensive understanding of the subject matter.
[90-95]	A	
[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: Thu., January 8	**COMMUNITY DAY: Thu. Jan. 29**
LAST DAY FOR WITHDRAWL AND RECEIVE TUTION REFUND: Sun., January 18	**MID-SEMESTER BREAK: Thu. Feb. 19**
LAST DAY FOR WITHDRAWL WITHOUT ACADEMID PENALTY: Fri., March 20	
LAST DAY OF CLASSES: Thu., April 9	
FINAL EXAM; Thu. April 16	

Phys 123 Tentative Syllabus of Topics for Winter 2015

Text Sections	Topics Covered
12.1-12.7	**Temperature and Heat**: temperature scales, thermal expansion, internal energy and specific heat capacity
14.1-14.3	**Ideal Gas Law and Kinetic Theory of Gases**
15.1-15.7, 15.11	**Thermodynamics**: $0^{th} - 3^{rd}$ laws of thermodynamics, thermal processes, specific heat capacities, entropy
18.1-18.7	**Electric Forces and Electric Fields**: Nature of electricity, charges, electric forces, electrical material phases (conductors, insulators, semi-conductors), Coulomb's law, electric fields and field lines
19.1-19.6	**Electric Potential Energy and the Electric Potential**: Potential energy, potential difference, equipotential surfaces, capacitors and dielectrics, biomedical applications and superconductors
20.1-20.10	**Electric Circuits**: EMF and currents, Ohm's law and resistivity, electric power, alternating currents, series and parallel circuits, internal resistance, Kirchhoff's Rules
21.1-21.4, 21.7, 21.9	**Magnetism**: Nature of magnetic fields, magnetic force and Lorentz force, mass spectrometers, magnetic fields produced by currents, magnetic materials and superconducting Meissner effect
16.1, 16.2, 17.3	**Waves:** mathematics of wave phenomena, diffraction
24.1-24.3	**Electromagnetic Waves**: The nature of EM waves, the EM spectrum, speed of EM waves
27.1, 27.5	**Wave Properties of EM Radiation**: Linear superposition and diffraction

EXAM SCHEDULE: Midterm (50 minutes)   Feb. 6, 2015
                                        Final Exam (3 hours)   Apr. 16, 2015

NOTE: You are reminded that this outline is a guideline prepared for your information. Exceptional circumstances may require modification to the outline.