

UNIVERSITY OF CALGARY  
DEPARTMENT OF PHYSICS and ASTRONOMY  
COURSE OUTLINE

1. **Physics 255, Electromagnetic Theory I**

Lecture Sections: **L01:** TuTh, 11:00-12:15, Science Theatres 147  
Lab Sections: **B01:** T 14:00-17:00  
**B02:** W 09:00-12:00  
**B03:** W 15:00-18:00  
**B04:** T 18:00-21:00 all in Science Theatres 037

Instructor, **D.W. Hobill**

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e-mail address: [hobill@ucalgary.ca](mailto:hobill@ucalgary.ca)  
Office Hours: M W 10:00-11:30 (and by arrangement)

Departmental Office location: SB 605, telephone no.: (403)-220-5385

2. **PREREQUISITES:** Physics 211 or 221 or 227; Applied Mathematics 217 or Mathematics 249 or 251.

**ANTIREQUISITES:** Credit for any of Physics 255 and 259 or 323 or 355 will not be allowed.

Prior completion of or concurrent registration in Applied Mathematics 219 or Mathematics 253 or 283 is highly recommended.  
Open only to Physics or Astrophysics majors, or by permission of the Department.

3. **GRADING:** The University policy on grading and related matters is described sections F.1 and F.2 of the online University Calendar. In determining the overall grade in the course the following weights will be used:

Laboratories	15%
Assignments	15%
Midterm tests (3)	30% (In class exams – see Syllabus)
Final Examination	40% (To be scheduled by the Registrar)

Percentage grades will be given for all elements of term work and examinations. A weighted course percentage will be calculated for each student after the final exam is written. A table of conversion from final course percentage to final course letter grade will be provided later in the term.

4. **Missed Components of Term Work.** The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar in section 3.6: <http://www.ucalgary.ca/pubs/calendar/current/sc-3-6.html>. It is the student's responsibility to familiarize himself/herself with these regulations.  
See also <http://www.ucalgary.ca/pubs/calendar/current/e-3.html>.

5. **REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME-ACTIVITY.** If you have a clash with this out-of-class-time-activity, please inform your instructor as soon as possible so that alternative arrangements may be made for you.

6. **TEXTBOOK: smartPhysics: Electricity and Magnetism**, G. Gladding, M. Selen, T. Stelzer, W.H. Freeman 2011

7. **EXAMINATION POLICY:** Students are encouraged to read the Calendar, Section G, on Examinations:  
<http://www.ucalgary.ca/pubs/calendar/current/g.html>.

Department Approval \_\_\_\_\_

Date \_\_\_\_\_

Jan 4 13

8. **OTHER IMPORTANT INFORMATION FOR STUDENTS:**

(a) **ACADEMIC MISCONDUCT** (cheating, plagiarism, or any other form) is a very serious offense that will be dealt with rigorously in all cases. A single offense may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under K. Student Misconduct (<http://www.ucalgary.ca/pubs/calendar/current/k.html>) to inform yourself of definitions, processes and penalties

- (b) **ASSEMBLY POINTS** in case of emergency during class time. Be sure to **FAMILIARIZE YOURSELF** with the information at <http://www.ucalgary.ca/emergencyplan/assemblypoints>.
- (c) **ACADEMIC ACCOMMODATION POLICY**. Students with documentable disabilities are referred to the following links:  
Calendar entry on students with disabilities: <http://www.ucalgary.ca/pubs/calendar/current/b-1.html>  
Disability Resource Centre: <http://www.ucalgary.ca/drc/>
- (d) **SAFEWALK**: Campus Security will escort individuals day or night (<http://www.ucalgary.ca/security/safewalk/>). Call **220-5333** for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.
- (e) **FREEDOM OF INFORMATION AND PRIVACY**: This course will be conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPPA). As one consequence, **students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page**. For more information see also <http://www.ucalgary.ca/secretariat/privacy>.
- (f) **STUDENT UNION INFORMATION**: VP Academic Phone: 220-3911 Email: [suypaca@ucalgary.ca](mailto:suypaca@ucalgary.ca).  
SU Faculty Rep. Phone: 220-3913 Email: [sciencerep@su.ucalgary.ca](mailto:sciencerep@su.ucalgary.ca) Website <http://www.su.ucalgary.ca/home/contact.html>.  
Student Ombudsman: <http://www.su.ucalgary.ca/services/student-services/student-rights.html>
- (i) **INTERNET and ELECTRONIC COMMUNICATION DEVICE Information**. You can assume that in all classes that you attend, **your cell phone should be turned off**. Also, communication with other individuals, via laptop computers, Blackberries or other devices connectable to the Internet is not allowed in class time unless specifically permitted by the instructor. If you violate this policy you may be asked to leave the classroom. Repeated abuse may result in a charge of misconduct.

# Course Syllabus

## Electromagnetic Theory I

This course introduces the concepts of charges and currents and their associated Electric and Magnetic fields. The topics to be covered in this course will consist of the following:

Week:

### ELECTRICITY

1. Coulombs Law, Electric Fields (Chap: 1,2)
2. Electric Flux and Field Lines (Chap 3)
3. Gauss Law (Chap 4)
4. Electric Potential Energy, Electric Potentials (Chap 5,6)
5. Conductors and Capacitance (Chap 7)

### DC CIRCUITS

6. Capacitors (Chap 8)
7. Electric Circuits, Currents, Resistors (Chap 9)
8. Kirchoff's Rules, RC circuits (Chap 10, 11)

### MAGNETISM

9. Magnetic Fields and Forces (Chap 12, 13)
10. Forces and Torques on Currents (Chap 13)
11. Biot-Savart Law, Ampere's Law (Chap 14, 15)
12. Motional EMF (Chap 16)
13. Faraday's Law (Chap 17)

There will be three midterm examinations (held in class). They will take place during weeks (4, 8, and 12).