

UNIVERSITY OF CALGARY  
DEPARTMENT OF PHYSICS and ASTRONOMY  
COURSE OUTLINE

1. Course: **Physics 259, Electricity and Magnetism** (for students in Engineering), Winter 2013

Lecture Sections: **L01:** MWF 15:00 – 15:50 EDC 179 and R 17:00 – 17:50 CHC 105 Winter 2013  
**L02:** MWF 08:00 – 08:50 CHC 119 and R 08:00 – 08:50 CHC 105 Winter 2013  
**L03:** MWF 09:00 – 09:50 EDC 179 and W 13:00 – 13:50 CHC 105 Winter 2013  
**L04:** MWF 16:00 – 16:50 CHC 119 and R 14:00 – 14:50 KNB 132 Winter 2013

Instructors: L01: **Dr. Tittel** SB 315 220-4760 wtittel@qis.ucalgary.ca Office Hours: R 14:00-15:00  
L02: **Dr. Jackel** SB 639 220-4271 physics259@ucalgary.ca Office Hours: R 11:00-13:00  
L03: **Dr. Moazzen-Ahmadi** SB 525 220-5394 ahmadi@phas.ucalgary.ca Office Hours: M 13:00-15:00  
L04: **Dr. Stil** SB 519 220-8015 stil@ras.ucalgary.ca Office Hours: R 10:00-12:00

**Main Office:** SB 605, 220-5385 **Blackboard Course:** PHYS 259 ALL - (Winter 2013) - Electricity And Magnetism  
**PHYS 259 Course Website:** <http://webapps3.ucalgary.ca/~dppvan/phys259/>

2. **Prerequisites:** Applied Mathematics 217 and Mathematics 211

**Note:** Prior completion of or concurrent registration in Applied Mathematics 219 is highly recommended.

**Note:** In Physics 259, the Faculty of Engineering prerequisite policy is applied. You are advised to contact the Engineering Faculty Office, EN C 204, if you have questions about prerequisites.

3. The University policy on grading and related matters is described in 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:

<b>Assignments (13)</b>	<b>13%</b>	<b>Midterm Exam</b>	<b>25%</b>
<b>Laboratories (12)</b>	<b>12%</b>	<b>Final Examination</b>	<b>50%</b>
<b>Bonus: Diagnostic Tests</b>	<b>2% (maximum bonus)</b>		

There will be a Final Examination scheduled by the Registrar's Office. Students who fail the Final Examination should not expect to receive a course grade higher than D+. A grade of at least C- in the laboratorial portion of the course is necessary for a passing grade in the course.

Calculation of final grade in Phys 259: Percentage grades will be given for all elements of term work and examinations in Physics 259. A weighted course percentage will be calculated for each student after the final exam is written, using the weights provided above. A table of conversion from final course percentage to final course letter grade is available in the Course Information folder on the Phys 259 Blackboard site.

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. Dates and times of class exercises held outside of class hours: **Evening midterm test** Thursday, February 16, 1845 – 2015.

**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:** "University Physics", 13<sup>th</sup> Edition, by Young and Freedman, Addison-Wesley.

7. **EXAMINATION POLICY:** On the midterm and the final examination, you are required to use the Schulich School of Engineering approved calculator. 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

Associate Dean's Approval for  
out of regular class-time activity:



Date:

Jan 7 / 13

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

- (a) **ACADEMIC MISCONDUCT** (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence 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 (FOIPP). 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**: [suvpaca@ucalgary.ca](mailto:suvpaca@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.

*BJJ 2013-01-03*

## Physics 259 Course Outline

Text Reference	Topics
	General Introduction to Course
	<b><i>Electric Forces and Fields</i></b>
21.1	Electric Charge
21.2	Conductors, Insulators, and Induced Charges
21.3	Coulomb's Law
21.4	Electric Field and Electric Forces.
21.5	Electric-Field Calculations
21.6	Electric Field Lines
22.1	Charge and Electric Flux
22.2	Calculating Electric Flux
22.3	Gauss's Law
22.4	Applications of Gauss's Law
22.5	Charges on Conductors
	<b><i>Electric Potential Energy and Potential; Capacitors</i></b>
23.1	Electric Potential Energy
23.2	Electric Potential
23.3	Calculating Electric Potential
23.4	Equipotential Surfaces
23.5	Potential gradient
24.1	Capacitors and Capacitance
24.2	Capacitors in Series and Parallel
24.3	Energy Storage in Capacitors and Electric-Field Energy
24.4	Dielectrics
24.5	Molecular Model of Induced Charge
	<b><i>DC (Direct Current) Electric Circuits</i></b>
25.1	Electric Current
25.3	Resistance
25.2	Resistivity
25.4	Electromotive Force and Circuits
25.5	Energy and Power in Electric Circuits
26.1	Resistors in Series and Parallel
26.3	Electrical Measuring Instruments
26.4	R-C Circuits

<b>Text Reference</b>	<b>Topics</b>
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***Magnetic Forces and Fields***

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|------|---|
| 27.1 | Magnetism   |
| 27.2 | Magnetic Field  |
| 27.3 | Magnetic Field Lines and Magnetic Flux                  |
| 27.4 | Motion of Charged Particles in a Magnetic Field         |
| 27.5 | Applications of Motion of Charged Particles             |
| 27.6 | Magnetic Force on a Current-Carrying Conductor          |
| 27.7 | Force and Torque on a Current Loop                      |
| 27.8 | DC Motors   |
| 27.9 | The Hall Effect   |
| 28.1 | Magnetic Field of a Moving Charge                       |
| 28.2 | Magnetic Field of a Current Element (Biot-Savart Law).  |
| 28.3 | Magnetic Field of a Straight Current-carrying Conductor |
| 28.4 | Force Between Parallel Conductors                       |
| 28.5 | Magnetic Field of a Circular Current Loop               |
| 28.6 | Ampere's Law  |
| 28.7 | Applications of Ampere's Law                            |

***Electromagnetic Induction***

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|------|-------------------------------------|
| 29.1 | Induction Experiments               |
| 29.2 | Faraday's Law                       |
| 29.3 | Lenz's Law                          |
| 29.4 | Motional Electromotive Force        |
| 29.6 | Eddy Currents                       |
| 30.1 | Mutual Inductance                   |
| 30.2 | Self-inductance and Inductors       |
| 30.3 | Inductors and Magnetic Field Energy |
| 30.4 | The R-L Circuit                     |

**The last day of lectures for Winter, 2013, is Tuesday, April 16.**

**Friday, February 15 MIDTERM TEST: 18:30-20:00, covering Chapters 21, 22 and 23.**

**Monday, February 18 is Alberta Family Day - University closed (but libraries open).**

**February 17-24 is Reading Week. No lectures. University open except Monday.**

**Friday, March 29 is Good Friday - University closed (but libraries open).**