

UNIVERSITY OF CALGARY
DEPARTMENT OF PHYSICS and ASTRONOMY
COURSE OUTLINE

1. Course: **Physics 259, Electricity and Magnetism** (for students in Engineering), Winter 2012

Lecture Sections: **L01:** MWF 15:00 – 15:50 SB 103 **and** R 17:00 – 17:50 SB 103 Winter 2012
L02: MWF 08:00 – 08:50 ICT 102 **and** R 08:00 – 08:50 ICT 102 Winter 2012
L03: MWF 09:00 – 09:50 CHC 119 **and** W 13:00 – 13:50 EDC 179 Winter 2012
L04: MWF 16:00 – 16:50 EDC 179 **and** R 14:00 – 14:50 KNB 132 Winter 2012

Instructors: L01: **Dr. Jackel** SB 627 220-4271 brian.jackel@ucalgary.ca Office Hours: R 14:00 – 16:00
L02: **Dr. Wilson** SB 531 220-6088 wjfwilso@ucalgary.ca Office Hours: W 13:10 – 15:10
L03: **Dr. Moazzen-Ahmadi** SB 525 220-5394 ahmadi@phas.ucalgary.ca Office Hours: M 14:00 – 16:00
L04: **Dr. Stil** SB 519 220-8015 stil@ras.ucalgary.ca Office Hours: W 10:00 – 12:00

Main Office: SB 605, 220-5385 **Blackboard Course:** PHYS 259 ALL - (Winter 2012) - 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:

Assignments (13)	13%	Midterm Exam	25%
Laboratories (12)	12%	Final Examination	50%
Bonus: Diagnostic Tests	1% (maximum bonus)		

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+.

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 Tuesday, February 28, 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", 13th 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 _____

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

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.
SU Faculty Rep. **Phone:** 220-3913 **Email:** 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.

Physics 259 Course Schedule, Winter 2012

Week	Text Reference	Topics	Assignment and Laboratories
<i>Electric Forces and Fields</i>			
Jan 09-13		General Introduction to Course -----	Labatorial #1: Mechanics Review
	21.1	Electric Charge	
	21.2	Conductors, Insulators, and Induced Charges	1st Diagnostic Test: Due 11:59 pm Sun Jan. 15
	21.3	Coulomb's Law	Assignment #1 (Intro to MP): Due 11:59 pm Sun., Jan. 15
Jan 16-20	21.4	Electric Field and Electric Forces -----	Labatorial #2: Electric Charges & Forces.
	21.5	Electric-Field Calculations	Assignment #2 (Math Review): Due 11:59 pm Wed., Jan. 18
	21.6	Electric Field Lines	Assignment #3: Due 11:59 pm Sun., Jan. 22
Jan 23-27	22.1	Charge and Electric Flux -----	Labatorial #3: Electric fields
	22.2	Calculating Electric Flux	
	22.3	Gauss's Law	
	22.4	Applications of Gauss's Law	
	22.5	Charges on Conductors	Assignment #4: Due 11:59 pm Sun., Jan. 29
<i>Electric Potential Energy and Potential; Capacitors</i>			
Jan 30-Feb 03	23.1	Electric Potential Energy -----	Labatorial #4: Gauss's Law
	23.2	Electric Potential	
	23.3	Calculating Electric Potential	Assignment #5: Due 11:59 pm Sun., Feb. 05
Feb 06-10	23.4	Equipotential Surfaces -----	Labatorial #5: Motion of Charges
	23.5	Potential gradient	
	24.1	Capacitors and Capacitance	
	24.2	Capacitors in Series and Parallel	Assignment #6: Due 11:59 pm Sun., Feb. 12
Feb 13-17	24.3	Energy Storage in Capacitors and Electric-Field Energy - - -	Labatorial #6: Electric Potential
	24.4	Dielectrics	
	24.5	Molecular Model of Induced Charge	
<i>DC (Direct Current) Electric Circuits</i>			
	25.1	Electric Current	
	25.2	Resistivity	Assignment #7: Due 11:59 pm Sun., Feb. 19
<p>Monday, February 20 is Alberta Family Day - University closed (but libraries open). February 19-26 is Reading Week. No lectures. University open except Monday.</p>			
Feb 27-Mar 02	25.3	Resistance -----	Labs: Open Tutorial for Midterm
	25.4	Electromotive Force and Circuits	(in place of Labatorial #7)
	25.5	Energy and Power in Electric Circuits	
	26.1	Resistors in Series and Parallel	Assignment #8: Due 11:59 pm Sun., Mar. 4

Tuesday, February 28 MIDTERM TEST: 18:45-20:15, covering Chapters 21, 22 and 23.

Week	Text Reference	Topics	Assignments and Laboratories
Mar 05-09	26.3 26.4	Electrical Measuring Instruments ----- R-C Circuits	Labatorial #8: Current and Energy in Circuits
		<i>Magnetic Forces and Fields</i>	
	27.1 27.2 27.3	Magnetism Magnetic Field Magnetic Field Lines and Magnetic Flux	Assignment #9: Due 11:59 pm Sun., Mar. 11
Mar 12-16	27.4 27.5 27.6 27.7	Motion of Charged Particles in a Magnetic Field Applications of Motion of Charged Particles Magnetic Force on a Current-Carrying Conductor Force and Torque on a Current Loop	Labatorial #9: Circuits Assignment #10: Due 11:59 pm Sun., Mar. 18
Mar 19-23	27.8 27.9 28.1 28.2	DC Motors ----- The Hall Effect Magnetic Field of a Moving Charge Magnetic Field of a Current Element (Biot-Savart Law).	Labatorial #10: Magnetic Fields and Forces Ass't #11: Due 11:59 pm Sun., Mar. 25
Mar 26-30	28.3 28.4 28.5 28.6 28.7	Magnetic Field of a Straight Current-carrying Conductor Force Between Parallel Conductors Magnetic Field of a Circular Current Loop Ampere's Law Applications of Ampere's Law	Lab #11: Force & Torque on a Loop Assignment #12: Due 11:59 pm Sun., Apr. 1
		<i>Electromagnetic Induction</i>	
Apr 02-05	29.1 29.2 29.3 29.4	Induction Experiments ----- Faraday's Law Lenz's Law Motional Electromotive Force	Labatorial #12: Force between Currents Assignment #13: Due 11:59 pm Sun., Apr. 08
Apr 09-13	29.6 30.1 30.2 30.3 30.4	Eddy Currents ----- Mutual Inductance Self-inductance and Inductors Inductors and Magnetic Field Energy The R-L Circuit	Labatorial #13: Electromagnetic Induction 2nd Diagnostic Test: Opens Thurs Apr. 12 (Assignment #14: Practice assignment) 2nd Diagnostic Test: Due 11:59 pm Fri Apr. 20

The last day of lectures for Winter, 2012, is Friday, April 13.

Calendar of Laboratories, Assignments and Tests

Week	Labatorials	Assignments	Tests
Week #1: Jan 09 - 13	#1: Mechanics Review		
Mon. Jan 09 - Sun. Jan. 15			1st Diagnostic Test
Sun. Jan. 15 11:59 pm		#1: Intro to MP	
Week #2: Jan 16 - 20	#2: Electric Charges & Forces		
Wed. Jan. 18 11:59 pm		#2: Math Review	
Sun. Jan. 22 11:59 pm		Assignment #3	
Week #3: Jan 23 - 27	#3: Electric Fields		
Sun. Jan. 29 11:59 pm		Assignment #4	
Week #4: Jan 30 - Feb 03	#4: Gauss's Law		
Sun. Feb. 05 11:59 pm		Assignment #5	
Week #5: Feb 06 - 10	#5: Motion of Charges		
Sun. Feb. 12 11:59 pm		Assignment #6	
Week #6: Feb 13 - 17	#6: Electric Potential		
Sun. Feb. 19 11:59 pm		Assignment #7	
February 20 - 26: Reading Break			
Week #7: Feb 27 - Mar 02	No Labs.		
Mon - Tues Feb 27 - 28	Open Tutorial for Midterm Review		
Tues. Feb. 28 6:45 pm			Midterm Test
Sun. Mar. 04 11:59 pm		Assignment #8	
Week #8: Mar 05 - 09	#8: Current and Energy in Circuits		
Sun. Mar. 11 11:59 pm		Assignment #9	
Week #9: Mar 12 - 16	#9: Circuits		
Sun. Mar. 18 11:59 pm		Assignment #10	
Week #10: Mar 19 - 23	#10: Magnetic Fields & Forces		
Sun. Mar. 25 11:59 pm		Assignment #11	
Week #11: Mar 26 - 30	#11: Force & Torque on a Loop		
Sun. Apr. 01 11:59 pm		Assignment #12	
Week #12: Apr 02 - 05	#12: Force between Currents		
Sun. Apr. 08 11:59 pm		Assignment #13	
Week #13: Apr 09 - 13	#13: Electromagnetic Induction		
Mon. Apr 09 onward		Ass't #14 (<i>practice</i>)	
Thurs Apr 12 - Fri Apr 20			2nd Diagnostic Test
Mon Apr 16 - Wed Apr 25			Final Exam Period