



DEPARTMENT OF PHYSICS AND ASTRONOMY
COURSE OUTLINE

1. Course: Physics 259, Electricity and Magnetism (for students in Engineering), Winter 2018

Lecture Sections: **L01:** MWF 15:00 – 15:50 ENA 201 **and** R 17:00 – 17:50 ENA 201
L02: MWF 08:00 – 08:50 ENA 201 **and** R 08:00 – 08:50 ENA 201
L03: MWF 09:00 – 09:50 ENG 60 **and** W 13:00 - 13:50 MFH 162
L04: MWF 16:00 – 16:50 ICT 102 **and** R 14:00 – 14:50 ENG 60

Instructors: L01: Dr. Abusara | SB 130 | zabusara@ucalgary.ca | 403-220-3041
L02: Dr. Langill | SA101B | pplangil@ucalgary.ca | 403-220-5402
L03: Dr. Langill | SA101B | pplangil@ucalgary.ca | 403-220-5402
L04: Dr. Stotyn | SA101C | sean.stotyn@ucalgary.ca | 403-210-7594

Office Hours: Each Instructor will make their office time known via D2L or in lecture.

Course Coordinator: Dr. Marzena Kastyak-Ibrahim | SB 507 | 403-220-8073 | marzena.kastyakibrah@ucalgary.ca
D2L Course sites: PHYS 259 L01- L04 - (Winter 2018) - Electricity and Magnetism (for students in Engineering)
PHYS 259 B01 - B36 (Winter 2018) - Electricity and Magnetism (for students in Engineering)

Departmental Office: SB 605, 403-220-5385, phasugrd@ucalgary.ca. Students must use their U of C account for all course correspondence.

2. Prerequisites: See section 3.5.C in the Faculty of Science section of the online Calendar.

Applied Mathematics 217 or Mathematics 265 or 275 and Mathematics 211. Credit for Physics 259 and either 255 or 323 will not be allowed. Prior completion of or concurrent registration in Mathematics 277 is highly recommended.

3. Grading: 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:

Activities	10%	(3% TopHat+2% pre-activity quiz+5% group work)
Assignments (WileyPlus)	10%	
Labatorials	15%	(Beginning week of Jan 15) 9 labs and 8 end of lab problems
Midterm test	25%	(Tue Feb 13, 2018 , 19:00-21:00, rooms TBA)
Final Examination	40%	(To be scheduled by the Registrar)

Each piece of work (reports, assignments, quizzes, midterm exam(s) or final examination) submitted by the student will be assigned a grade. The student's grade for each component listed above will be combined with the indicated weights to produce an overall percentage for the course, which will be used to determine the course letter grade.

A student's final letter grade will be determined using the percentage to letter grade conversion scale below unless that student falls within the following exception: if the student's overall course grade is greater than 50%, but the student receives less than 50% weighted average on the midterm and final examination OR receives 0% on the final exam, the student will receive a D in the course.

The conversion between a percentage grade and letter grade is as follows;

> = 95 %	A +	> = 80 %	B +	> = 65 %	C +	> = 50 %	D +
> = 90 %	A	> = 75 %	B	> = 60 %	C	> = 45%	D
> = 85%	A -	> = 70 %	B -	> = 55 %	C -	< 45 %	F

As your term work items (labs, assignments and exams) accumulate, the marks for students will be posted on D2L. The marks that appear on this website are the marks that will be used to determine each student's overall course grade. Check your marks frequently. Missing or incorrectly posted term work marks should be reported to your TA (lab marks) or course coordinator (all other marks) as soon as they are noticed (no later than 15 days since the mark has been posted (<http://www.ucalgary.ca/pubs/calendar/current/i-2.html>)). You should be prepared to produce the original work to verify the requested correction.

- 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. It is the student's responsibility to familiarize himself/herself with these regulations. See also Section E.6 of the University Calendar

Missed Laboratories

Students are NOT allowed to attend a different laboratory section than the one in which they are registered. A make-up lab session will be scheduled in the last week of classes. You can make-up **one** laboratory. Priority for scheduling a make-up lab will be given to students who missed a lab for a legitimate reason. A note from a physician/counselor should be provided. Please fill in the form: Make-up Laboratory Request (see D2L/ Content/ Forms missed lab/ exam), save it as the Excel Spreadsheet and email it to Dr. Kastyak-Ibrahim, the Undergraduate Learning Coordinator at marzena.kastyakibrah@ucalgary.ca in order to arrange for a make-up laboratory as soon as you know that you might need one. Requests submitted more than 7 days after the date of the missed lab will not be considered.

Missed assignments:

Please contact Dr. Kastyak-Ibrahim, the Undergraduate Learning Coordinator at marzena.kastyakibrah@ucalgary.ca if you have a legitimate reason for missing a deadline for an assignment. Sleeping in, forgetting about the deadline etc. is NOT considered a legitimate reason.

Missed midterm:

Students who miss the midterm because of ill health, or for other valid reasons, will most often be granted an excused absence by the Course Coordinator provided that alleged problems are supported in writing by a person in a position of authority (physician, counselor, etc.). In the case of a missed exam due to illness or other legitimate reason, please fill in the form: Missed midterm (see D2L/ Content/ Forms missed lab/ exam), save it as the Excel Spreadsheet and email it to Dr. Kastyak-Ibrahim, the Undergraduate Learning Coordinator at marzena.kastyakibrah@ucalgary.ca along with the note preferably the day of the exam, but no later than 11:59 pm the day after the exam. Once the claim is substantiated, **the weight of the midterm will be shifted to the final exam**.

- 5. Scheduled out-of-class activities:** Dates and times of class exercises held outside of class hours: **Evening midterm test Tuesday, February 13, 2018 (19h00-21h00)**.

REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME-ACTIVITY. If you have a conflict with the out-of-class-time-activity, please contact your course coordinator no later than **14 days prior** to the date of the out-of-class activity so that alternative arrangements may be made. Please fill in the form: Midterm time conflict (see D2L/ Content/ Forms missed lab/ exam), save it as the Excel Spreadsheet and email it to Dr. Kastyak-Ibrahim, the Undergraduate Learning Coordinator at marzena.kastyakibrah@ucalgary.ca. If the course coordinator will not be notified on time, the only possible accommodation will be shifting the weight of the midterm to the final exam.

- 6. Human studies statement:** Students will not participate as subjects or researchers in human studies.

- 7. Reappraisal of Grades:**

A student wishing a reappraisal, should first attempt to review the graded work with the Course coordinator/instructor or department offering the course. Students with sufficient academic grounds may request a reappraisal. Non-academic grounds are not relevant for grade reappraisals. Students should be aware that the grade being reappraised may be raised, lowered or remain the same. See Section I.3 of the University Calendar.

- a) Term Work:** The student should present their rationale as effectively and as fully as possible to the Course coordinator/instructor within 15 days of either being notified about the mark, or of the item's return to the class. If the student is not satisfied with the outcome, the student shall immediately submit the Reappraisal of Graded Term work

form to the department in which the course is offered. The department will arrange for a re-assessment of the work if, and only if, the student has sufficient academic grounds. See sections I.1 and I.2 of the University Calendar

b) **Final Exam:** The student shall submit the request to Enrolment Services. See Section I.3 of the University Calendar.

8. **Course Materials:** " *Fundamentals of Physics*", 10th Edition, by Halliday, Resnick and Walker, Wiley

9. **Examination Policy:** On the midterm and the final examination, you are only allowed to use the Schulich School of Engineering approved calculator. Students should also read the Calendar, [Section G](#), on Examinations.

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

(a) **Academic Misconduct:** 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 Section K. Student Misconduct to inform yourself of definitions, processes and penalties. Examples of academic misconduct may include: submitting or presenting work as if it were the student's own work when it is not; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; collaborating in whole or in part without prior agreement of the instructor; borrowing experimental values from others without the instructor's approval; falsification/ fabrication of experimental values in a report. **These are only examples.**

(b) **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on [assembly points](#).

(c) **Student Accommodations:** Students needing an accommodation because of a disability or medical condition should contact Student Accessibility Services in accordance with the procedure for accommodations for students with disabilities available at [procedure-for-accommodations-for-students-with-disabilities_0.pdf](#). Students needing an accommodation in relation to their coursework or to fulfill requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to the Associate Head of the Department of Physics & Astronomy, Dr. David Feder by email dfeder@ucalgary.ca or phone 403-220-3638. Religious accommodation requests relating to class, test or exam scheduling or absences must be submitted no later than **14 days** prior to the date in question:
<http://www.ucalgary.ca/pubs/calendar/current/e-4.html>

(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 is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIP). 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 www.ucalgary.ca/legalservices/foip.

(f) **Student Union Information:** VP Academic, Phone: 403-220-3911 Email: suvcaca@ucalgary.ca. SU Faculty Rep., Phone: 403-220-3913 Email: sciencerep@su.ucalgary.ca. Student Ombudsman, Email: suvcaca@ucalgary.ca.

(g) **Internet and Electronic Device Information:** You can assume that in all classes that you attend, your cell phone should be turned off unless instructed otherwise. 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.

(h) **Surveys:** At the University of Calgary, feedback through the Universal Student Ratings of Instruction (USRI) survey and the Faculty of Science Teaching Feedback form provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses. Your responses make a difference - please participate in these surveys.

(i) **SU Wellness Center:** The Students Union Wellness Centre provides health and wellness support for students including information and counselling on physical health, mental health and nutrition. For more information, see www.ucalgary.ca/wellnesscentre or call 403-210-9355.

(j) COURSE INCOMES

Students coming into PHYS 259 should be able to:

- Demonstrate ability to solve the quadratic formula
- Use trigonometry and basic geometry to solve problems
- Employ basic algebraic manipulations
- Perform derivatives and integrals

(k) COURSE OUTCOMES

By the end of the course, students will be expected to:

- Exploit and use symmetry to simplify physical problems in electricity and magnetism.
- Apply the principle of superposition to calculate the electric and magnetic fields of extended objects.
- Develop mathematical models of physical situations.
- Carry out calculations symbolically (in terms of physical variables) and numerically (using appropriate values and their units)
- Obtain experimental data and relate them to predicted physical laws governing electricity and magnetism.
- Communicate and collaborate effectively within a team environment.

(l) LABORATORIALS

Laboratorials begin the week of Monday, Jan. 15th, 2018. Laboratorials take place in ST 036 and 038, and students will have been assigned to a particular room, on a particular day of the week, by the Registrar's Office when enrolling in Physics 259. In general, the format of the laboratorials is as follows: Working in groups, students make their way through a carefully written workbook crafted to help students ponder, discuss, and learn concepts being covered in their lectures. TAs offer assistance and guidance, and check student understanding periodically throughout the session. Laboratorials typically involve a class demonstration, computer simulations, or some apparatus, and the tasks presented to students vary accordingly.

The laboratorials workbook documents will be available on D2L. (Content/ Lab write-ups) Students are to print out their own copies and take them to their laboratorial section to do their work.

It is the student's responsibility to ensure their laboratorials marks as posted on D2L are correct. A student's laboratorial mark will not be revised in the D2L gradebook if more than 15 days has passed since the laboratorial grade has been posted.

Physics 259 Laboratorial Schedule – Winter 2018

Week	Dates	Laboratorial
1	Jan 8-12	No Laboratorials
2	Jan 15-19	Laboratorial 1 Electric Charges and Forces
3	Jan 22-26	Laboratorial 2 Electric Fields
4	Jan 29- Feb 2	Laboratorial 3 Motion of Charges
5	Feb 5-9	Laboratorial 4 Gauss' Law
6	Feb 12-16	No Laboratorials (Midterm week)
Feb 19-23 Reading Break. No lectures. University open.		
7	Feb 26-Mar 2	Laboratorial 5 Electric Potential
8	Mar 5-9	Laboratorial 6 Capacitors
9	Mar 12-16	Laboratorial 7 Play-Doh-Resistors
10	Mar 19-23	Laboratorial 8 Charge to mass ratio experiment
11	Mar 26-29	No Laboratorials (Good Friday week)
12	Apr 2-6	Laboratorial 9 Magnetic Fields & Forces
13	Apr 9-13	Make-up laboratorials

(m) WileyPLUS On-line ASSIGNMENTS

Your text, **Fundamentals of Physics by Halliday, Resnick and Walker** is available in the bookstore bundled with a WileyPLUS code. You should buy the book or WileyPLUS standalone and keep this code, as it will be used to access the online homework system.

To register, please go to www.wileyplus.com login in the top, right hand corner with your U of C email address as your username and your 8 digit student ID as your password. If you took the course last year and changed your password to something different than your student ID, the change will remain intact. For any technical support issues, go to www.wileyplus.com/support and choose the live chat option.

A new text comes bundled with a code, which will give you access to the eBook, Assignments, Tutorials, Videos, Animations and Orion, an adaptive learning self-practice system.

If you would like to purchase just WileyPLUS by itself (without the text), you can do so through the bookstore or else from www.wileyplus.com.

Lastly, if you are not able to purchase a new book or the WileyPLUS standalone, you will be able to access the homework in the Taylor Library. You will not have access to any of the other WileyPLUS materials, and must do your homework in the library, but can upgrade at any time. You will need to register as directed above, and choose the free option.

Physics 259 Assignment Schedule – Winter 2018

Assignment Name	Material covered	Available for students	Due date
Assignment 0	Intro to WP	Monday, January 08, 2018	Monday, January 15, 2018
Assignment 01 - Winter 2018	Math Review	Wednesday, January 10, 2018	Wednesday, January 17, 2018
Assignment 02 - Winter 2018	Week 1 and 2	Wednesday, January 17, 2018	Wednesday, January 24, 2018
Assignment 03 - Winter 2018	Week 3	Wednesday, January 24, 2018	Wednesday, January 31, 2018
Assignment 04 - Winter 2018	Week 4	Wednesday, January 31, 2018	Wednesday, February 07, 2018
Midterm practice assignment	Weeks 1-5	Monday, February 05, 2018	N/A
Assignment 05 - Winter 2018	Weeks 5-6	Wednesday, February 14, 2018	Wednesday, February 28, 2018
Assignment 06 - Winter 2018	Week 7	Wednesday, February 28, 2018	Wednesday, March 07, 2018
Assignment 07 - Winter 2018	Week 8	Wednesday, March 07, 2018	Wednesday, March 14, 2018
Assignment 08 - Winter 2018	Week 9	Wednesday, March 14, 2018	Wednesday, March 21, 2018
Assignment 09 - Winter 2018	Week 10	Wednesday, March 21, 2018	Wednesday, March 28, 2018
Assignment 10 - Winter 2018	Week 11	Wednesday, March 28, 2018	Wednesday, April 04, 2018
Final practice assignment	Week 1-13	Wednesday, April 04, 2018	N/A

(n) ACTIVITIES

In order to help students to better understand and learn course material there will be additional activities. Participation will earn students 10% toward their overall course grade.

- In class individual TopHat questions (3%)
- Pre-activity quizzes (2%), due at 11:59 pm on Thursday preceding each activity, completed via D2L/ quizzes
- In class group activities and problem solving (4%)
- Peer evaluation of group work (1%)

As a vehicle to encourage class participation and student interaction as well as providing instructors with rapid, in-class feedback, the TopHat system will be employed. A demonstration of this system could happen in your lecture section in the first week of classes. **Each lecture section will have its own TopHat course name which will be given to you by your instructor.**

The type and number of response questions you will encounter over the semester is at the sole discretion of your instructor. If students make any attempt to answer a question they get 1 mark, and if they get the answer correct they get 1 more mark.

Such questions are worth 2 marks. Some of the questions asked will not have a specific correct answer and are worth 1 mark.

Pre-activity quizzes are 4-5 multiple-choice question quizzes set on D2L (Assessments/ quizzes) designed to help you prepare individually to group activities scheduled on Fridays (see lecture schedule below). They are due at 11:59 pm on Thursday preceding each activity.

In class Friday activities will be completed by each group (you will work with the same group as during laboratorials; groups will be formed during the first week of laboratorials with the help of lab TAs). You will be given a worksheet and the completed work should be submitted via D2L Dropbox (group). Please ensure at least one group member has a device allowing you to take a picture of your completed work, convert it to PDF file and submit to D2L. In order to evaluate the contribution of each member of the group you will be completing the peer evaluation at the end of the term. Peer evaluation will count for 1% of your grade.

Physics 259 Lecture Schedule – Winter 2018

Week	Dates	Text	Topics	Labatorial
Week 1	Jan 8-12	Chapter 21/22	Brief intro to course and E & M	No Labatorials
			Charges and Coulombs Law simple examples	
			Coulombs Law in 2D	
			Dipole and symmetry	
Week 2	Jan 15-19	Chapter 21/ 22	Electric force form a finite line	Labatorial 1 Electric Charges and Forces
			Electric force form a ring and disk of charge	
			Electric field and symmetry	
			Activity	
Week 3	Jan 22-26	Chapter 22/23	Electric field lines and point charges in E-field	Labatorial 2 Electric Fields
			Dipoles in electric field (torque, energy), polarization	
			Flux	
			Activity	
Week 4	Jan 29- Feb 2	Chapter 23	Gauss' Law intro, spherical symmetry	Labatorial 3 Motion of Charges
			Gauss' Law intro, cylindrical and planar symmetry	
			Applications for insulators	
			Activity	
Week 5	Feb 5-9	Chapter 24	Electric potential energy	Labatorial 4 Gauss' Law
			Electric potential	
			Calculation of the potential for insulators	
			Activity	
Midterm Exam – Tuesday February 13 th				
Week 6	Feb 12-16	Chapter 23-25	Review for midterm on Tuesday	No Labatorials (Midterm week)
			Equipotential surfaces, potential gradients	
			Charges on conductors (Gauss' Law)	
			Charges on conductors (Gauss' Law) continued, intro to capacitors and capacitance;	
Feb 19-23 Reading Break. No lectures. University open.				
Week 7	Feb 26- Mar 2	Chapter 25	Properties of capacitors followed by Gauss law to get capacitance	Labatorial 5 Electric Potential
			Energy Storage in Capacitors and Electric-Field Energy	
			Dielectrics	
			Activity	

Week	Dates	Text	Topics	Labatorial
Week 8	Mar 5-9	Chapter 26/27	Electric Current, current density	Labatorial 6 Capacitors
			Resistance, Resistivity, molecular view of Ohm's Law	
			RC circuits	
			Activity.	
Week 9	Mar 12-16	Chapter 28	Magnetic Fields, Magnetic Field Lines, Motion of Charged Particles in a Magnetic Field	Labatorial 7 Play-Doh-Resistors
			Cyclotrons and mass spectrometer	
			Hall Effect with examples	
			Activity to drive home the topics covered	
Week 10	Mar 19-23	Chapter 28/29	Magnetic Force on a Current-Carrying Conductor	Labatorial 8 Charge to mass ratio experiment
			Force and Torque on a Current Loop plus Energy (magnetic dipole)	
			Magnetic Field of a Current Element (Biot-Savart Law)	
			Activity	
Week 11	Mar 26-29	Chapter 29	Ampere's Law	No Labatorials (Good Friday week)
			Coaxial cable, superposition, other examples	
			Solenoids and toroids	
			No Activity - Good Friday	
Week 12	Apr 2-6	Chapter 30	Faraday's Law & Lenz's Law	Labatorial 9 Magnetic Fields & Forces
			Examples and applications (motional EMF, non-conservative electric fields)	
			Examples and applications (motional EMF, non-conservative electric fields)	
			Activity	
Week 13	Apr 9-13	Chapter 30	Self-inductance and Inductors; Inductors and Magnetic Field Energy	Make-up labatorials
			The R-L Circuit	
			Review	
			Review	

Department Approval _____ Date _____