



UNIVERSITY OF CALGARY  
FACULTY OF SCIENCE  
DEPARTMENT OF PHYSICS & ASTRONOMY  
COURSE OUTLINE

1. **Course:** PHYS 223, Introductory Electromagnetism, and Thermal Physics -- Summer 2018

Instructor Name	Email	Phone	Office	Hours
<i>L01:</i> ( MWF 10:00 - 11:50 in SB 142)				
Ziad Abu Sara	zabusara@ucalgary.ca	220-3041	SB130	MW 9-9:50

**Course Site:**

D2L: PHYS 223 L01 - (Summer 2018) - Introductory Electromagnetism, and Thermal Physics

**Department of Physics & Astronomy:**

Office: Science B 605

Phone: 403 220-5385

Email: office@phas.ucalgary.ca

**Note:**

Students must use their U of C account for all course correspondence.

2. **Requisites:**

See section [3.5.C](#) in the Faculty of Science section of the online Calendar.

**Prerequisite(s):** Physics 211 or 221 or 227.

**Notes:** For students intending to major in Biological Sciences, Chemistry, Geology, or Geophysics.

3. **Grading:**

The University policy on grading and related matters is described in [F.1](#) and [F.2](#) of the online University Calendar. In determining the overall grade in the course the following weights will be used:

Course components	Weight
Assignments	10%
Labatorials	15%
Activities	15%
In-class quizzes (2), July 18 and August 8	10%
Midterm test (July 27, during the class)	20%
Final examination	30%

**ACTIVITIES**

In order to help students to better understand and learn course material there will be additional activities. Participation will earn students 15% toward their overall course grade.

- 7% for in class group activities and problem solving (TopHat Group)
- 8% for individually answered TopHat questions (Top Hat Individual)

The TopHat system is an on-line tool used as a vehicle to encourage class participation and student interaction as well as providing instructors with rapid, in-class feedback. A demonstration of this system could happen in your lecture section in the first week of classes.

Each lecture section will have two TopHat course names which will be given to you by your instructor. One will be used for group activities, the other one for questions encouraging participation.

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.

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

	A+	A	A-	B+	B	B-	C+	C	C-	D+	D
<b>Minimum % Required</b>	95 %	90 %	85 %	80%	75%	70 %	65 %	60%	55%	50 %	45 %

This course has a registrar scheduled final exam.

#### 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/themselves with these regulations. See also [Section E.3](#) of the University Calendar.

##### Missed midterm

Students who miss the midterm because of ill health, or for other valid reasons, will most often be granted an excused absence **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, students must fill in the form Missed Midterm (Excel file, should be saved as an Excel file) posted on D2L (Folder: Forms missed lab or exam) and email it to Dr. Abusara 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 of illness is substantiated, **the weight of the midterm will be shifted to the final exam**.

##### Missed Laboratories

Students are NOT allowed to attend a different lab section than the one in which they are registered. A makeup lab session will be scheduled in the last week of classes. You can make-up one lab. 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 lab request (Excel file, should be saved as an Excel file) posted on D2L (Folder: Forms missed lab or exam) and email it to Dr. Abusara at [zabusara@ucalgary.ca](mailto:zabusara@ucalgary.ca) in order to arrange for a make-up lab as soon as you know that you might need one. Requests submitted more than 3 days after the date of the missed lab will not be considered.

##### Missed assignments

Please contact Dr. Abusara at [zabusara@ucalgary.ca](mailto:zabusara@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 in-class quizzes

There are no make-ups for the in class quizzes. If you have a legitimate reason for missing in-class quiz, please fill in the form Missed Quiz (Excel file, should be saved as an Excel file) posted on D2L (Folder: Forms missed lab or exam) and email it to Dr. Abusara along with the note the day of the quiz, at the latest. Once the claim is substantiated, **the weight of the first quiz will be shifted to the midterm while the weight of the second quiz will be shifted to the final**. Sleeping in, missing the bus etc. is NOT considered a legitimate reason.

#### 5. Scheduled out-of-class activities:

There are no scheduled out of class activities for this course.

In Summer 2018 the quizzes and midterm for this course session will be during regularly scheduled lectures.

#### 6. Course Materials:

Required Textbook(s):

R. D. Knight, *Physics for Scientists and Engineers*: Pearson .

#### 7. Examination Policy:

No aids are allowed on tests or examinations. Closed book exam and mid-term test with formula sheet provided; calculator allowed;

Students should also read the Calendar, [Section G](#), on Examinations.

## 8. Approved Mandatory and Optional Course Supplemental Fees:

There are no mandatory or optional course supplemental fees for this course.

## 9. Writing across the Curriculum Statement:

For all components of the course, in any written work, the quality of the student's writing (language, spelling, grammar, presentation etc.) can be a factor in the evaluation of the work. See also Section [E.2](#) of the University Calendar.

## 10. Human studies statement:

See also [Section E.5](#) of the University Calendar.

Students will not participate as subjects or researchers in human studies.

## 11. 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.

1. **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
2. **Final Exam:** The student shall submit the request to Enrolment Services. See [Section I.3](#) of the University Calendar.

## 12. OTHER IMPORTANT INFORMATION FOR STUDENTS:

- a. **Mental Health** The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the mental health resources available throughout the university community, such as counselling, self-help resources, peer support or skills-building available through the SU Wellness Centre (Room 370, MacEwan Student Centre, [Mental Health Services Website](#)) and the Campus Mental Health Strategy website ([Mental Health](#)).
- b. **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](http://www.ucalgary.ca/wellnesscentre) or call [403-210-9355](tel:403-210-9355).
- c. **Sexual Violence:** The University of Calgary is committed to fostering a safe, productive learning environment. The Sexual Violence Policy (<https://www.ucalgary.ca/policies/files/policies/sexual-violence-policy.pdf>) is a fundamental element in creating and sustaining a safer campus environment for all community members. We understand that sexual violence can undermine students' academic success and we encourage students who have experienced some form of sexual misconduct to talk to someone about their experience, so they can get the support they need. The Sexual Violence Support Advocate, Carla Bertsch, can provide confidential support and information regarding sexual violence to all members of the university community. Carla can be reached by email ([svsa@ucalgary.ca](mailto:svsa@ucalgary.ca)) or phone at [403-220-2208](tel:403-220-2208).
- d. **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.**
- e. **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on [assembly points](#).

- f. **Academic Accommodation Policy:** 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.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 [phas.ahugrd@ucalgary.ca](mailto:phas.ahugrd@ucalgary.ca) or phone 403-220-8127. 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. See [Section E.4](#) of the University Calendar.

- g. **Safewalk:** Campus Security will escort individuals day or night (See the [Campus Safewalk](#) website). Call [403-220-5333](tel:403-220-5333) for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.
- h. **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). 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 [Legal Services](#) website.
- i. **Student Union Information:** [VP Academic](#), Phone: [403-220-3911](tel:403-220-3911) Email: [suvpaca@ucalgary.ca](mailto:suvpaca@ucalgary.ca). SU Faculty Rep., Phone: [403-220-3913](tel:403-220-3913) Email: [sciencerep@su.ucalgary.ca](mailto:sciencerep@su.ucalgary.ca). Student Ombudsman, Email: [suvpaca@ucalgary.ca](mailto:suvpaca@ucalgary.ca).
- j. **Internet and Electronic Device Information:** Unless instructed otherwise, cell phones should be turned off during class. All communication with other individuals via laptop, tablet, smart phone or other device is prohibited during class unless specifically permitted by the instructor. Students that violate this policy may be asked to leave the classroom. Repeated violations may result in a charge of misconduct.
- k. **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.

## LABATORIALS

Labatorials begin on Tuesday, July 10, 2018. They take place in ST 030 and 032, and students will have been assigned to a particular room by the Registrar's Office when enrolling in Physics 223. In general, the format of the labatorials 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. Labatorials typically involve a class demonstration, computer simulations, or some apparatus, and the tasks presented to students vary accordingly.

The labatorials workbook documents will be available on D2L. Students are to print out their own copies and take them to their labatorials section to do their work.

### PHYS 223 Labatorial Schedule - Summer 2018

Week	Dates	Labatorial number and topic
1	July 2-6	Tuesday: NO LABATORIALS Thursday: NO LABATORIALS
2	July 9-13	Tuesday: Labatorial 1 Electric Charges and Forces Thursday: Labatorial 2 Electric Fields
3	July 16-20	Tuesday: Labatorial 3 Equipotential Lines Thursday: Labatorial 4 Electric Circuits
4	July 23-27	Tuesday: No LABATORIALS Thursday: NO LABATORIALS
5	July 30-Aug 3	Tuesday: Labatorial 5 Magnetic Field in a Slinky Thursday: Labatorial 6 Charge to mass ratio experiment

6	Aug 6-10	Tuesday: Labatorial 7 Ideal Gas Law Thursday: Labatorial 8 First Law of Thermodynamics
7	Aug 13-15	Tuesday: Make-up Labatorials

## MASTERING PHYSICS On-line ASSIGNMENTS

How to access MasteringPhysics:

- Go to <http://www.masteringphysics.com> and click "Student" under Register Here
- Click "OK Register Now"
- Enter your Course ID: **PHYS223SUMMER2018**
- Sign in if you already have a Pearson account (perhaps you used MasteringAstronomy, MathXL, MyStatLab, etc. in another course). If you don't already have a Pearson account then you can create one here.
- Select "Access Code" if you have an access code that came in your textbook package or that you purchased separately from the bookstore. You can also buy access at this point.
- Copy and paste your access code into the field provided.
- Click "Enter My Course"
- To join your instructors course, select "Yes" and enter the Course ID: **PHYS223SUMMER2018**
- Enter your U of C Student ID
- Congratulations you are now ready to use MasteringPhysics!

### If you choose to access your MasteringPhysics assignments without purchasing access:

Mastering Physics includes an electronic version of your textbook which can be used on a computer or in an app on your smart phone or tablet. It also includes access to a Study Area which includes video demonstrations, MCAT prep quizzes, simulations, app based study modules and more. If you are not interested in the electronic book or additional resources and only in access to the homework assignments please email Pearson at **ucphysics.mastering@gmail.com** to get an access code and registration instructions. Note, the code for assignment only version is only valid for one term, so if you got one in the past you need to request it again. Once you have registered in MasteringPhysics, with these emailed instructions. Join a Course by entering the MasteringPhysics Course ID "**PHYS223SUMMER2018**".

### PHYS 223 Assignment Schedule - Summer 2018

Week	Dates	Assignments	Available	Due Date
1	July 2-6	Assignment 0 - Intro to MP Assignment 1	Tuesday, July 3, 2018	Friday, July 6, 2018
2	July 9-13	Assignment 2 Assignment 3	Friday, July 6, 2018	Friday, July 13, 2018
3	July 16-20	Assignment 4 Assignment 5	Friday, July 13, 2018	Friday, July 20, 2018
<b>Midterm exam on Friday, July 27th</b>				
4	July 23-27	Assignment 6	Friday, July 20, 2018	Friday, July 27, 2018
5	July 30-Aug 3	Assignment 7 Assignment 8	Friday, July 27, 2018	Friday, August 3, 2018
6	Aug 6-10	Assignment 9 Assignment 10	Friday, August 3, 2018	Friday, August 10, 2018
7	Aug 13-15	Practice assignment 11	Friday, August 10, 2018	No due date

## Physics 223 Lecture Schedule - Summer 2018

Week	Dates	Topics	Textbook readings	Labatorial
1	July 3-6	Coulomb's law. Electric field $E$ of a point charge, distributions of point charges,  E of continuous charge distributions. Parallel plate capacitors. Motion of charged particles in $E$ fields.	22.4, 22.5, 23.1 - 23.7	Tues: NO LABATORIALS  Thurs: NO LABATORIALS
2	July 9-13	Electric potential energy of point charges. Electric Potential $V$ . $V$ in a capacitor. $V$ due to point charges.  The connection between $E$ and $V$ . $E$ fields of charged conductors. Capacitance and Capacitors	25.1 - 25.7  26.1 - 26.5	Tues: Electric Charges and Forces  Thurs: Electric Fields
<b>In-class quiz July 18, 2018</b>				
3	July 16-20	Resistance and Ohm's law. Direct current circuits.  Introduction to magnetism. Currents and magnetic fields.	27.1 - 27.5, 28.1 - 28.7  29.1 - 29.5	Tues: Equipotential Lines  Thurs: Electric Circuits
<b>Midterm exam on Wednesday, July 27th</b>				
4	July 23-27	Induced current. Motional emf. Magnetic flux. Lenz's Law.  Lorenz force. Cyclotron motion. Hall Effect. Magnetic forces on straight wires and current loops.	30.1 - 30.4  29.7 - 29.9	Tues: NO LABATORIALS  Thurs: NO LABATORIALS
5	July 30-Aug 3	Concepts of Pressure. Gauge Pressure. Thermodynamic state variables. Temperature. Phase changes.  Ideal gases. Ideal gas processes. Pressure-Volume diagrams. Work in ideal gas processes. Heat.	14.1 - 14.3, 18.1 - 18.5  18.6 - 18.7, 19.1 - 19.3	Tues: Magnetic Field in a Slinky  Thurs: Charge to mass ratio experiment
<b>In-class quiz August 8, 2018</b>				

6	Aug 6-10 (No class Aug 6)	First Law of thermodynamics. Thermal properties of matter. Calorimetry. Specific heats of gases.  Gas particle collisions and resulting temperature and pressure.	19.4 - 19.7  20.1 - 20.3	Tues: Ideal Gas Law  Thurs: First Law of Thermodynamics
7	Aug 13-15 (Aug 15 is last day of semester)	Thermal energy and Specific Heat. Heat-Transfer Mechanisms.	20.4, 19.8	Tues: Make-up Laboratories

### COURSE INCOMES

Students coming into PHYS 223 should be able to:

- Perform basic derivatives and integrals;
- Apply vector notation and algebra in one and two dimensions;
- Develop mathematical models of physical situations.

**Department Approval:**

Electronically Approved

**Date:** 2018-06-26 14:41

### 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 for electromagnetism and thermal physics;
- 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.