



DEPARTMENT OF PHYSICS AND ASTRONOMY
COURSE OUTLINE

1. **Course:** Physics 223, Thermodynamics, Electricity & Magnetism– Winter 2018

L01: MWF: 12:00 – 12:50 : ENA 201 | Dr. Sean Stotyn | SA101C | sean.stotyn@ucalgary.ca | Phone: 403-210-7594

L02: TR 12:30 - 13:45 : ST 148 | Dr. Anna Harlick | SB533 | anna.harlick@ucalgary.ca | Phone: 403-220-8648

L03: MWF: 16:00 – 16:50 : ENA 201 | Neda Amiri | SB 130 | amirin@ucalgary.ca | Phone: 403-210-9670

Course Coordinator: Dr. Marzena Kastyak-Ibrahim | SB 507 | marzena.kastyakibrah@ucalgary.ca | 403-220-8073

D2L Course PHYS 223 L01-L03 - (Winter 2018) - Introductory Electromagnetism, and Thermal Physics

PHYS 223 B01 - B33 (Winter 2018) - Introductory Electromagnetism, and Thermal Physics

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

Office Hours: Each Instructor will make their office time known via D2L or in lecture. Students must use their U of C account for all course correspondence.

MasteringPhysics Course ID – PHYSICS223WINTER2018

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

Physics 211 or 221 or 227. For students intending to major in Biological Sciences, Chemistry, Geology, or Geophysics.

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:

Assignments (Mastering Physics): 15%

Labatorials (8): 15%

Activities: 10 % (4% pre-readings + 3% TopHat Individual+3% TopHat group work)

In-class quiz: 10%

Midterm Exam: 20%

Final Exam: 30%

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 quizzes, 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.3 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**.

Scheduled out-of-class activities:

Midterm Exam will be held on **Tuesday Feb 27th, from 19:00 – 21:00**

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/instructor 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 as soon as possible so that alternative arrangements may be made for you. Students are expected to make every effort to attend the midterm exam. If you have a legitimate conflict, you must inform the course coordinator **at least 2 weeks prior** to the exam dates so that alternative arrangements may be made. 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.

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

6. 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.

7. **Course Materials:** *R.D. Knight, Physics for Scientists and Engineers: A Strategic Approach, 4th Edition, Addison-Wesley.*
8. **Examination Policy:** Closed book exam and mid-term test with formula sheet provided. Rules pertaining to the use of calculators, and other devices, during exams will be discussed in lecture. Students should also read the Calendar, Section G, on Examinations: <http://www.ucalgary.ca/pubs/calendar/current/g.html>.
9. **Approved Mandatory and Optional Course Supplemental Fees:** None

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) **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_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 (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 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.

Website: <http://www.su.ucalgary.ca>. Student Ombudsman: <http://www.ucalgary.ca/provost/students/ombuds>

(j) **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

(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 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

(l) **LABATORIALS**

Labatorials begin Monday, Jan. 15th, 2018. Labatorials take place in ST 030 / 032 / 034, 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 223.

Physics 223 Labatorial Schedule – Winter 2018

Week	Dates	Labatorial
1	Jan 8-12	NO LABATORIALS
2	Jan 15-19	Labatorial 1 Electric Charges and Forces
3	Jan 22-26	Labatorial 2 Electric Fields
4	Jan 29- Feb 2	Drop-in session (Mon & Tue: week of the quiz)
5	Feb 5-9	Labatorial 3 Equipotential Lines
6	Feb 12-16	Labatorial 4 Electric Circuits
Feb 19-26 Reading Break. No lectures. University open.		
7	Feb 26-Mar 2	NO LABATORIALS (week of the midterm)
*** Midterm Exam – Tuesday February 27 th ***		
8	Mar 5-9	Labatorial 5 Magnetic Field in a Slinky
9	Mar 12-16	Labatorial 6 Charge to mass ratio experiment
10	Mar 19-23	Labatorial 7 Ideal Gas Law
11	Mar 26-29	NO LABATORIALS (week of Good Friday)
12	Apr 2-6	Labatorial 8 First Law of Thermodynamics
13	Apr 9-13	Make-up labatorials/ Drop-in sessions

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

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

(m) **MASTERING PHYSICS On-line ASSIGNMENTS**

Mastering Physics assignments are due by 23:59 on Wednesday nights. The first graded assignment is due Wednesday, January 17th, 2018. A practice, not for credit, MP assignment will be made available for students to attempt (Assignment 0). Please see detailed schedule of the assignments below.

Physics 223 Assignment Schedule – Winter 2018

Assignment Name	Material covered	Available for students	Due date
Assignment 0	Intro to MP	Monday, January 08, 2018	Monday, January 15, 2018
Assignment 01 - Winter 2018	Week 1	Wednesday, January 10, 2018	Wednesday, January 17, 2018
Assignment 02 - Winter 2018	Week 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
Assignment 05 - Winter 2018	Week 5	Wednesday, February 07, 2018	Wednesday, February 14, 2018
Midterm practice	Week 1-6	Wednesday, February 14, 2018	N/A
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

** As was the case in Phys211/221, all students must sign-up to access Mastering Physics **

If you have a **MasteringPhysics** account, **Sign In** at <http://www.masteringphysics.com> and enter your Username and Password. If you cannot remember your username or your password, click [Forgot your username or password?](#) and enter the email address you used to register for MasteringPhysics. Your login name and password will be sent to your email.

If you have purchased the package with MasteringPhysics in the bookstore:

- Go to www.pearsoncustom.com/can/ucphys and click Register Here under Register / Purchase Access. and click **Students** under **Register**.
- Select **Yes, I have an Access Code** Click **Next**.
- **License Agreement and Privacy Policy:** Click **I Accept** to indicate that you have read and agree to the license agreement and privacy policy.
- Select the appropriate option under “Do you have a Pearson Education account?” Continue to give the requested information until you complete the process. The **Confirmation & Summary** page confirms your registration. This information will also be emailed to you for your records. You can either click **Log In Now** or return to www.masteringphysics.com later.
 - Select the appropriate option under “Do you have a Pearson Education account?” (**Note:** if you have used a Pearson MyLab/Mastering at U of C you will have an account). If **No**, create a username/pass word. If **Yes**, Sign In with your username/password. Can't remember? Click [Forgot your username or password?](#) Enter your **Access Code**, click **Next** and complete the registration information.

If you choose to just access the MasteringPhysics assignments without purchasing access to the study material please email Pearson at ucphysics.mastering@gmail.com to get an access code and registration instructions. You will be access only the assignments.

Once you have registered in MasteringPhysics, **Join a Course** by entering the MasteringPhysics Course ID – **PHYSICS223WINTER2018**

(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.

- 4% for pre-reading quizzes (due every Sunday). Quizzes will be available on Thursday on Mastering Physics
- 3% for in class group activities and problem solving (TopHat Group)
- 3% for individually answered TopHat questions (Top Hat Individual)

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.

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. For group activities questions asked will have a specific correct answer and only the mark for correct answer will be assigned.

Physics 223 Lecture Schedule – Winter 2018

Week	Dates	Topics	Textbook readings	Labatorial
1	Jan 8-12	Coulomb's law. Electric field of a point charge and distributions of point charges.	22.4, 22.5, 23.1 – 23.2	NO LABATORIALS
2	Jan 15-19	Electric field of continuous charge distributions. Parallel plate capacitors. Motion of charged particles in E fields.	23.3 - 23.6-7	Labatorial 1 Electric Charges and Forces
3	Jan 22-26	Electric potential energy of point charges. Electric Potential. V in a capacitor. V due to point charges.	25.1 - 25.7	Labatorial 2 Electric Fields
In-class quiz Jan 31st and Feb 1st, 2018				
4	Jan 29-Feb 2	The connection between E and V. E fields of charged conductors. Capacitance and Capacitors	26.1 - 26.5	NO LABATORIALS (week of the quiz)
5	Feb 5-9	Resistance and Ohm's law. DC circuits.	27.1 - 27.5, 28.1 - 28.7	Labatorial 3 Equipotential Lines
6	Feb 12-16	Introduction to magnetism. Currents and magnetic fields.	29.1 - 29.5	Labatorial 4 Electric Circuits
Feb 19-23 Reading Break. No lectures. University open.				
7	Feb 26-Mar 2	Induced current. Motional emf. Magnetic flux. Lenz's Law.	30.1 - 30.4	NO LABATORIALS
*** Midterm Exam – Tuesday Feb 27th ***				
8	Mar 5-9	Lorentz force. Cyclotron motion. Hall Effect. Magnetic forces on straight wires and current loops.	29.7 - 29.9	Labatorial 5 Magnetic Field in a Slinky
9	Mar 12-16	Concepts of Pressure. Gauge Pressure. Thermodynamic state variables. Temperature. Phase changes.	14.1 - 14.3, 18.1 - 18.5	Labatorial 6 Charge to mass ratio experiment
10	Mar 19-23	Ideal gases. Ideal gas processes. pV diagrams. Work in ideal gas processes. Heat.	18.6 – 18.7, 19.1 - 19.3	Labatorial 7 Ideal Gas Law
11	Mar 26-29	First Law of thermodynamics. Thermal properties of matter. Calorimetry. Specific heats of gases.	19.4 - 19.7	NO LABATORIALS (GOOD FRIDAY)
12	Apr 2-6	Gas particle collisions and resulting temperature and pressure.	20.1 – 20.3	Labatorial 8 First Law of Thermodynamics
13	Apr 9-13	Thermal energy and Specific Heat. Heat-Transfer Mechanisms.	20.4, 19.8	Make-up laboratorials

Department Approval _____ Date _____