

### COURSE OUTLINE

#### 1. **Course:** PHYS 223, Introductory Electromagnetism, and Thermal Physics - Summer 2021

Lecture 01: MWF 10:00 - 11:50 - Online

Instructor	Email	Phone	Office	Hours
Dr. Anita Corn	anita.corn@ucalgary.ca	None	NONE	Tuesdays and Thursdays noon to 1:00 pm via Zoom.

Students should go to "Notes to Print Before Lectures" and print the class notes for a given lecture prior to attending that lecture.

#### **Online Delivery Details:**

This course is being offered online in real-time via scheduled meeting times, you are required to be online at the same time.

To help ensure Zoom sessions are private, do not share the Zoom link or password with others, or on any social media platforms. Zoom links and passwords are only intended for students registered in the course. Zoom recordings and materials presented in Zoom, including any teaching materials, must not be shared, distributed or published without the instructor's permission.

Lectures will be online via Zoom MWF from 10:00 am to 11:50 am.

Laboratorials and Tutorials: online via Zoom on Tuesdays and Thursdays during the times scheduled by the Registrar. Check your scheduled time. You will need Xcel, which can be downloaded free of charge using your Office 365 account.

Zoom lecture sessions will be recorded and posted online. In order to protect your privacy, you may not use your video camera. To ask a question, use the raised-hand feature in Zoom.

Any questions you have outside of class should be asked during office hours or posted in "Discussions" in D2L. Email is also acceptable, but office hours and the Discussions forum are preferred because all students can benefit. I will look at the Discussions forum and my email at least once each day except for Saturday. However, that does not mean I will look at email and Discussions every 24 hours. EG: one day I may answer my emails at 10:00 am and they next at 7:00 pm. So expect an answer within 48 hours, during the week and within 72 hours on weekends.

Tutorials are mandatory problem-solving sessions that will take place in your lab section.

#### **Course Site:**

D2L: PHYS 223 L01-(Summer 2021)-Introductory Electromagnetism, and Thermal Physics

**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.

#### 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:

Component(s)	Weighting %	Date
Homework (via Pearson Mastering and/or D2L Dropbox)	24	Due 30 min before lecture after assigned. E.G.: HW assigned on Mon is due 30 min prior to lecture on the following Wed. (no makeups)
Pre-lab submissions (via D2L Dropbox)	8	Due 30 min before your lab section (no makeups)
In-class submissions (via Zoom chat and/or Zoom poll)	12	Due in class (no makeups)
Laboratorials/Tutorials (via Zoom)	11	Due at the end of each lab (no makeups)
Exam 1	15	July 9, 2021 during lecture
Exam 2	15	July 23, 2021 during lecture
Exam 3	15	August 11, 2021 during lecture

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 %

After Exams 1 and 2, your "projected" grade will be calculated. A projected grade is the grade you will get if you continue to do as well in the course as you have done so far. Any student who has a projected grade below 63% is STRONGLY advised to seek extra help to pull up his/her grade. I want to see every one of you completing this course with a strong C or above.

While students are encouraged to work together on homework and in labs, any material you submit must be your own understanding of the material. That is, don't just copy someone else's work.

See **Missed Work** and **Writing Across the Curriculum Statement** for more information re grading.

#### 4. **Missed Components Of Term Work:**

The university has suspended the requirement for students to provide evidence for absences. Please do not attend medical clinics for medical notes or Commissioners for Oaths for statutory declarations.

In the event that a student legitimately fails to submit any online assessment on time (e.g. due to illness etc...), please contact the course coordinator, or the course instructor if this course does not have a coordinator to arrange for a re-adjustment of a submission date. Absences not reported within 48 hours will not be accommodated. If an excused absence is approved, one possible arrangement is that the percentage weight of the legitimately missed assignment could also be pro-rated among the components of the course. This option is at the discretion of the coordinator and may not be a viable option based on the design of this course.

If you miss one lab or tutorial, one homework assignment, one pre-lab, and/or one in-class assignment, you will be given a zero for that assignment. However, your lowest lab score, lowest homework score, lowest pre-lab score, and lowest in-class assignment score will all be dropped. So it is not necessary to contact Dr. Corn to arrange a different submission date.

If you miss a second tutorial or assignment:

1) Contact Dr. Corn within 48 hours if you have a legitimate reason (eg, due to illness or family emergency) to arrange a different submission date/time.

Unfortunately there is no way to make up a second missed lab or pre-lab.

Students are NOT allowed to attend a lab section different than their own.

**Missed Exams:** If you are legitimately unable to take an exam on time, contact Dr. Corn within 48 hours. Any make-up exams will not be the same as the exam given to the rest of the class. But they will be written with the intent of making them equally difficult.

#### 5. **Scheduled Out-of-Class Activities:**

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

#### 6. **Course Materials:**

Recommended Textbook(s):

R.D. Knight, *Physics for Scientists and Engineers: A Strategic Approach, 4th Edition* Addison-Wesley Wiley.

You will need access to Mastering Physics.

In order to successfully engage in their learning experiences at the University of Calgary, students taking online, remote and blended courses are required to have reliable access to the following technology:

- A computer with a supported operating system, as well as the latest security, and malware updates;
- A current and updated web browser;
- Webcam/Camera (built-in or external);
- Microphone and speaker (built-in or external), or headset with microphone;
- Current antivirus and/or firewall software enabled;
- Stable internet connection.

For more information please refer to the UofC [ELearning](#) online website.

## 7. Examination Policy:

All exams are open resource, but **interacting with other students or other people during an exam is strictly forbidden**. Any work/answers you submit on your exams must be entirely your own.

Students must enter the lecture via Zoom with cameras on prior to accessing their exams (the Zoom session will be open no later than 9:50 am.). Recordings of exam sessions will not be posted online. Students may ask Dr. Corn questions during the exam via chat. Dr. Corn will only answer questions having to do with clarification of the questions. Those answers will be posted where everyone can see them.

All exams will be made available beginning 10:00 am on the day they are scheduled.

You will not be able to enter the exams after 10:30 am. Once you enter the exam, you will have one hour to complete it plus the 50% buffer time to allow for technical difficulties, for a total of 1.5 hours.

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.

When showing mathematical work, you must use standard conventions. There are two very good reasons for this.

- 1) showing your work without using these conventions is like writing without employing standard grammar and punctuation. It might actually be able to make it out but it should not have to.
- 2) The only way I, the TA, or the LAs can grade objectively is if we grade what you write, not if we grade what we think you may have meant. That is, The teaching/learning assistants and I will grade your work as it is written. We will make no assumptions or guesses regarding what you really meant.

## 10. Human Studies Statement:

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

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

## 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.

- a. **Term Work:** The student should present their rationale as effectively and as fully as possible to the Course coordinator/instructor within **ten business 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 submit the Reappraisal of Graded Term work form to the department in which the course is offered within 2 business days of receiving the decision from the instructor. The Department will arrange for a reappraisal of the work within the next ten business days. The reappraisal will only be considered if the student provides a detailed rationale that outlines where and for what reason an error is suspected. 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.

## 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 Services:** 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 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). The complete University of Calgary policy on sexual violence can be viewed at (<https://www.ucalgary.ca/policies/files/policies/sexual-violence-policy.pdf>)
- d. **Misconduct:** Academic integrity is the foundation of the development and acquisition of knowledge and is based on values of honesty, trust, responsibility, and respect. We expect members of our community to act with integrity. Research integrity, ethics, and principles of conduct are key to academic integrity. Members of our campus community are required to abide by our institutional [Code of Conduct](#) and promote academic integrity in upholding the University of Calgary's reputation of excellence. Some examples of academic misconduct include but are not limited to: posting course material to online platforms or file sharing without the course instructor's consent; submitting or presenting work as if it were the student's own work; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; borrowing experimental values from others without the instructor's approval; falsification/fabrication of experimental values in a report. Please read the following to inform yourself more on academic integrity:

Additional information is available on the [Student Success Centre Academic Integrity page](#)

- e. **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.

- f. **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPPA). 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.

- g. **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: [ombuds@ucalgary.ca](mailto:ombuds@ucalgary.ca).

- 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. **Copyright of Course Materials:** All course materials (including those posted on the course D2L site, a course website, or used in any teaching activity such as (but not limited to) examinations, quizzes, assignments, laboratory manuals, lecture slides or lecture materials and other course notes) are protected by law. These materials are for the sole use of students registered in this course and must not be redistributed. Sharing these materials with anyone else would be a breach of the terms and conditions governing student access to D2L, as well as a violation of the copyright in these materials, and may be pursued as a case of student academic or [non-academic misconduct](#), in addition to any other remedies available at law.

### 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.

### 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)

Communicate and collaborate effectively within a team environment.

Date	Lec/Lab/Tut	Material Covered	Due
June 28	Lec	Ch 22.1 – 5 Coulomb's law, Electric field of a point particle, Distributions of point charges	
June 29	Lab	Lab 1	Pre-lab 1
June 30	Lec	Ch 23.1 – 3, Ch 23.6, Electric field (EF) of continuous charge distributions, motion of charged particles in an EF, Begin Ch 25.1 – 7, Electric potential and potential energy	Homework 1 (HW 1)
July 1	Holiday		
July 2	Lec	More Ch 25.1 – 7, Electric potential and potential energy	HW 2
July 5	Lec	Ch 26.1 – 5, Connection between potential and EF, capacitance and capacitors	HW 3
July 6	Lab	Lab 2	Pre-lab 2
July 7	Lec	Catch up/Review	HW 4
July 8	Lab	Lab 3	Pre-lab 3
July 9	Lec	Exam I	
July 12	Lec	Discuss Exam I, Ch 27.1 – 5, Current and resistance	
July 13	Lab	Tutorial in lab sections	
July 14	Lec	Ch 28.1 – 7, Electrical circuits, introduction to magnetism	HW 5

July 15	Lab	Lab 4	Pre-lab 4
July 16	Lec	Ch 29.1 - 5, 7 - 9, Magnetic field (MF), magnetic force on moving charged particles and currents	HW 6
July 19	Lec	More Ch 29.1 - 5, 7 - 9, Ch 30.1 - 4, Electromagnetic induction	HW 7
July 20	Lab	Lab 5	Pre-lab 5
July 21	Lec	Review/Catch up	HW 8
July 22	Lab	Lab 6	Pre-lab 6
July 23	Lec	Exam II	
July 26	Lec	Discuss Exam II, Ch 14.1 -3, 18.1 - 5, Fluids, pressure, states of matter, temperature, thermal expansion	
July 27	Lab	Lab 7	Pre-lab 7
July 28	Lec	Continue Ch 18.1 - 5, Ch 18.6 - 7, Ideal gases	HW 9
July 29	Lab	Tutorial	
July 30	Lec	Ch 19.1 - 7, Work in idea gas processes, heat, first law of thermodynamics, thermal properties of matter, calorimetry, specific heats of gases	HW 10
August 2	Lec	Holiday	
August 3	Lab	Take a day off	
August 4	Lec	More ch 19.1 - 7	HW 11
August 5	Lab	Lab 8	Pre-lab 8
August 6	Lec	Catch up/review	HW 12
August 9	Lec	Catch up/review	
August 10	Lab	Tutorial	
August 11	Lec	Exam III	

**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.

Electronically Approved - Jun 30 2021 12:30

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**Department Approval**

Electronically Approved - Jun 30 2021 16:10

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**Associate Dean's Approval**