DALHOUSIE UNIVERSITY

Faculty of Science Course Syllabus
Department of Physics and Atmospheric Science

PHYC 2510: Electricity and Magnetism
Winter 2023

Instructor: **Philip Bennett** Philip.Bennett@dal.ca **Office: DUNN 226**

Lectures: Classes will be in-person – **T,Th 2:35 pm – 3:55 pm in LSC C234**.

Laboratories: n/a

Tutorials: There are 2 tutorial times scheduled for this course: **M,W 11:35 – 12:25 pm in Dunn 135**

The Monday tutorial times will be used as a tutorial, while the Wednesday tutorial times will be used for additional lectures. ***There will be no Monday tutorial on the first day of classes (Mon, Jan 9).***

Teaching Assistant: **Brett MacNeil**

Course Description

The course will develop the vector calculus needed for the description of electric and magnetic fields, and develop the complete solution of electrostatic and magnetostatic problems in vacuum. This description will subsequently be extended to solve analogous problems in real media. Other topics that will be discussed include scalar and vector potentials, forces on charges, and Maxwell's equations. The course will give students the necessary foundation for an understanding of more advanced topics in electricity and magnetism.

Course Prerequisites/Restrictions

PHYC 2060.03, a multi-variable calculus course (**MATH 2001.03 or 2120.03**, which can be taken concurrently), or permission of the instructor.

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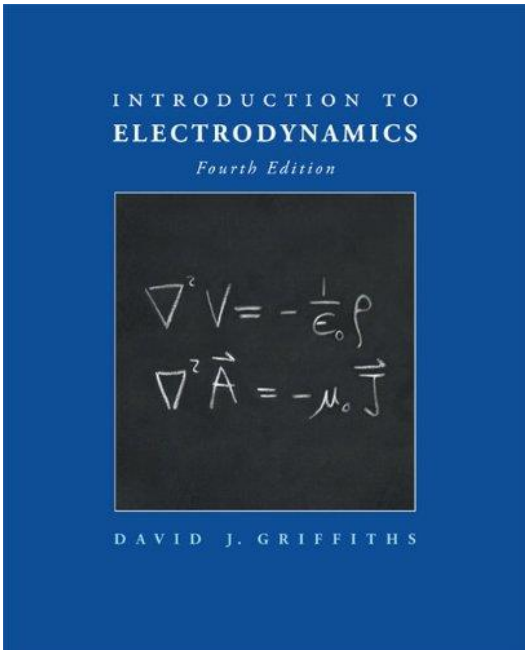
Course Objectives/Learning Outcomes – to learn the material in the following chapters of the course textbook – Introduction to Electrodynamics, by David Griffiths, 4th ed.

Chapter 1: Vector Calculus (some review & some new material)
Chapter 2: Electrostatics (in vacuum)
Chapter 3: Special Techniques, Analytic Methods (Section 3.4 only)
Chapter 4: Electric Fields in Matter
Chapter 5: Magnetostatics (in vacuum)
Chapter 6: Magnetic Fields in Matter

Course Textbook

- **Introduction to Electrodynamics, 4th ed. (required)**
- **Author:** David J. Griffiths
- **Publisher:** Cambridge University Press, 2017
- **ISBN:** 978-1-108-42041-9 (Hardcover)
- **Textbook Cover:**



Note: The **Griffiths 3rd edition** differs only slightly from the **4th edition** and is acceptable as the course textbook, although the problem numbering and pagination are slightly different. The older version of the 4th edition published by Pearson is identical in content and pagination to the current Cambridge University Press edition and may also be used as the course textbook.

Online Materials: Lectures will be provided using ***narrated Powerpoint and video presentations in Brightspace***. *To view narrated presentations,* ***you must have Microsoft Powerpoint*** *installed as Open Office does not support narrated presentations. However, you can view the video versions without Powerpoint.* A PDF version of the slides will also be available.

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Course Assessment

Component	Weight (% of final grade)	Date
Midterm Exam 1	***23%***	***Thurs, 16 Feb 2023, 2:35—5:05 pm, LSC C332***
Midterm Exam 2	***23%***	***Thurs, 16 Mar 2023, 2:35—5:05 pm, LSC C332***
Final Exam	***23%***	***Take-Home Exam, handed out on Thurs, 6 Apr 2023***
Assignments:	***30%***	***5-6 assignments over the term***

All three exams will carry an equal weight of 23.33% each. The total exam mark will be worth 70% of the total course mark and will be calculated using the average of the top two exams. The lowest scoring exam will not be used in the total course mark or final grade calculation.

Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale

A+	(90-100)	B+ (77-79)	C+ (65-69)	D (50-54)
A	(85-89)	B (73-76)	C (60-64)	F (<50)
A-	(80-84)	B- (70-72)	C- (55-59)	

Course Policies

- Be sure to plan your term to include the dates and times of the tests and the examination. You are expected to make all possible attempts to write exams on the date scheduled. ***Missed exams will NOT be rescheduled*** without advance notice in writing, and any such request must be well justified. If sick, please complete and submit the ***Student Declaration of Absence*** form.
- Assignments will be posted to Brightspace, and will generally be due in 2 weeks.
- Late assignments will receive an ***automatic 20% penalty per lecture after the deadline*** for assignments, unless justified to the instructor prior to the deadline. For example, assignments handed in one lecture late will be graded out of 80% of the full mark; assignments handed in two lectures late will be graded out of 60% of the full mark.
- ***Assignments will NOT be accepted*** (without prior permission of the instructor) more than 1-2 weeks after the deadline, because we will discuss the assignments after that time, and answers will be given.
- All examinations will be ***open book***, and various resources may be brought into the exam room including course textbooks, course notes, other written materials, and calculators. ***The average of the top 2 grades for the 3 exams (2 midterms & 1 final) will be used to calculate the overall exam grade***.
- Calculators will generally be ***required*** and should be brought to exams.
- Laptop computers, tablets, cell phones or other devices will be allowed in exams for the sole purpose of viewing of local files such as electronic copies of the course textbook or notes, or Brightspace course pages. ***No internet access outside of Dalhousie is allowed during exams.***

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- Students are ***strongly encouraged to work together on assignments*** since the purpose of assignments is not to evaluate students' knowledge (exams serve that purpose), but to help students learn the course material and analysis methods. However, the work that you submit ***must be your own***. All the drawings, observations, and calculations that you submit ***must be your own***, and any written work submitted *must* be written ***in your own words***.
- It is an ***academic offence*** to copy another student's solution, or to copy solutions obtained from solutions manuals, or by any other means other than your own work. Please note that instructors are obligated to report any academic offences to the Senate Disciplinary Committee. See the Academic Calendar for more details about intellectual honesty.
- Students are ***strongly encouraged to attend tutorials*** and participate in group problem-solving activities. You may ask anything you wish at the tutorials: help with the problem sets, solutions to the previous problem sets, but also about being a science major, and expectations in your current and upper year classes. We will use some tutorials to observe the night sky with departmental telescopes, weather permitting, and hold planetarium sessions on some cloudy nights.
- ***All students are required to comply with health and safety requirements on campus***, and should be considerate of others' health concerns. Non-compliance may be reported under the Code of Student Conduct.
- I have not set office hours, but will generally be available in my office (Dunn 226) Tuesday & Thursday afternoons until 5:00 pm, or by e-mail appointment request to Philip.Bennett@dal.ca.
  I try and respond promptly to all e-mails.

DALHOUSIE UNIVERSITY

Faculty of Science Course Syllabus (Section B) (revised June-2021)

University Policies and Statements

This course is governed by the academic rules and regulations set forth in the University Calendar and by Senate

Academic Integrity

At Dalhousie University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect (The Center for Academic Integrity, Duke University, 1999). As a student, you are required to demonstrate these values in all of the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity.

Information: https://www.dal.ca/dept/university_secretariat/academic-integrity.html

Accessibility

The Advising and Access Services Centre is Dalhousie's centre of expertise for student accessibility and accommodation. The advising team works with students who request accommodation as a result of a disability, religious obligation, or any barrier related to any other characteristic protected under Human Rights legislation (Canada and Nova Scotia).

Information: https://www.dal.ca/campus_life/academic-support/accessibility.html

Student Code of Conduct

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner—perhaps through a restorative justice process. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution.

Code: https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

Diversity and Inclusion – Culture of Respect

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness

Statement: http://www.dal.ca/cultureofrespect.html

Recognition of Mi'kmaq Territory

Dalhousie University would like to acknowledge that the University is on Traditional Mi'kmaq Territory. The Elders in Residence program provides students with access to First Nations elders for guidance, counsel and support. Visit or e-mail the Indigenous Student Centre (1321 Edward St) (elders@dal.ca).

Information: https://www.dal.ca/campus_life/communities/indigenous.html

Important Dates in the Academic Year (including add/drop dates)

https://www.dal.ca/academics/important_dates.html

University Grading Practices

https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html

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Faculty of Science Course Syllabus (Section C) (revised June-2021)

Student Resources and Support

Advising

General Advising https://www.dal.ca/campus_life/academic-support/advising.html

Science Program Advisors: https://www.dal.ca/faculty/science/current-students/academic-advising.html

Indigenous Student Centre: https://www.dal.ca/campus_life/communities/indigenous.html

Black Students Advising Centre: https://www.dal.ca/campus_life/communities/black-student-advising.html

International Centre: https://www.dal.ca/campus_life/international-centre/current-students.html

Academic supports

Library: https://libraries.dal.ca/

Writing Centre: https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html

Studying for Success: https://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html

Copyright Office: https://libraries.dal.ca/services/copyright-office.html

Fair Dealing Guidelines https://libraries.dal.ca/services/copyright-office/fair-dealing.html

Other supports and services

Student Health & Wellness Centre: https://www.dal.ca/campus_life/health-and-wellness/services-support/student-health-and-wellness.html

Student Advocacy: https://dsu.ca/dsas

Ombudsperson: https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html

Safety

Biosafety: https://www.dal.ca/dept/safety/programs-services/biosafety.html

Chemical Safety: https://www.dal.ca/dept/safety/programs-services/chemical-safety.html

Radiation Safety: https://www.dal.ca/dept/safety/programs-services/radiation-safety.html

Scent-Free Program: https://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html
Dalhousie COVID-19 information and updates: https://www.dal.ca/covid-19-information-and-updates.html