PHYS 326: Electricity and Magnetism
Course overview and syllabus

Overview

Instructor Tom Blake
E-mail tomblake@uvic.ca
Office Elliott 207

Lectures take place on Tuesday, Wednesday and Friday from 12:30–13:20. The first lecture will take place on Wednesday 9th September 2026. Information on office hours is available through the Brightspace course calendar.

Prerequisites

The prerequisites for this course are PHYS 216, PHYS 248 and MATH 204, and either concurrent enrolment or prior completion of either PHYS 301, MATH 342 or 346. The course is mathematically demanding. You are expected to have a grounding in calculus and vector algebra.

Recommend text books

These course notes are based loosely on "Introduction to Electrodynamics" 3rd edition or later by David J. Griffiths. Copies of this text book are available in the library. While it is not necessary to have a copy of this text book, it is recommended. The book includes a wide range of example problems that will be helpful in understanding material in the course.

Assessment

There will be two in-class midterms and an in-person final exam for this course. The final exam will take place in the December exam period (10–23 December 2026). There are also in person labs for this course.

Your final grade for the course will combine results from the examinations, labs and a series of assignments, with the following weighting scheme:

Component	Weight
Assignments	20%
Labs	20%
Midterm exams	20%
Final exam	40%

If the application of this scheme would result result in grades that are inconsistent with the University's grading descriptions, grades may be adjusted to be consistent with those descriptions.

Notwithstanding this procedure, you will:

- be assigned an N if you do not write the final examination or have not submitted all of the lab assignments;
- be assigned an F if you do not exhibit satisfactory performance (by obtaining a passing grade of more than 50%) on the labs and the final examination;
- be assigned an F if your overall course grade is $< 50\%$.

Grades of N and F are failing grades and factor into GPA as a value of zero.

Examinations

You will be able to bring a single page of handwritten notes to the midterm and final examinations. Formulae will be included at the front of each exam, or as part of the exam questions, to reduce the reliance on notes/memorisation. Basic calculators (without graphing capability, storage etc) may be used.

Assignments

It is anticipated that there will be six assignments for this course. The assignment component of the final grade will be based on the marks awarded from the best five out of the six assignments submitted by each student. Assignments are designed to be formative. It is recommended that students complete all six assignments irrespective of the marks awarded on other assignments that they have submitted.

The assignments feature a mixture of analytic examples of simplified problems and numerical problems that can be tackled in the Python programming language. The purpose of the computational questions is to develop your ability to use computational tools to solve more complex problems. You will be marked on your understanding of and approach to the problem, not on the written quality of your code.

The assignments are administered through Brightspace. You are expected to upload a PDF document with your work. It is your responsibility to ensure that these documents are legible and well organised. Late assignments are not accepted and will be assigned a mark of zero.

Labs

You must complete all labs and achieve an overall passing grade in the lab component to obtain credit for the course. You are expected to submit your lab work in a timely manner, respecting the deadlines set by the lab instructor. You will not be permitted to start a new experiment until the report from your previous lab has been submitted. All lab reports must be submitted before December 10th 2026. Per faculty of science rules, you will not be allowed to sit the final exam if you have not passed the lab component of the course.

There are two lab sections:

- B02 on Wednesday 15:30–18:20;
- B03 on Monday 18:30–21:20.

You should attend the lab section to which you are registered. There will be an introductory session for the Labs in the week of September 14th in the relevant lab section.

Tutorials

There are tutorials for this course. The tutorials take place on Wednesday from 08:30–09:20. The tutorials are run by the course TA. The first tutorial will take place on September 16th.

Accommodations

Arrangements for reasonable accommodations will be considered in line with the University's academic concessions regulations and the faculty of sciences guidelines. It is the responsibility of students to contact the instructor (and in the case of labs, both the lab and course instructors) as soon as reasonably possible. You are expected to give advance warning of any issues that could reasonably have been foreseen.

There will be no make up midterm exams. If you miss one mid-term exam, your final examination will be awarded a weight of 50%. If you miss both mid-term exams, your final examination will be awarded a weight of 60%. Your final grade will be assigned based on the weighted combination of the mid-terms that maximises the exam percentage.

Centre for accessible learning

The University is committed to creating a learning environment that is as accessible and inclusive as possible for all students. If you are a student with a disability of chronic health condition, advisors from the Centre for Accessible Learning (CAL) are available to discuss support, access and accommodations. If you anticipate, or experience, barriers to learning in this course you are encouraged to discuss your concerns with the instructor or to speak to advisors at CAL, who can communicate the concerns to the instructor.

Academic integrity

Academic integrity is treated seriously by the University and by the department. You can find the Universities policy on academic integrity in the undergraduate calendar and further details can be found in the Faculty of Sciences' code of conduct. Please make sure that you are familiar with the content of these documents and be aware of how material in these documents relates to the labs, assignments and examinations. If you have any questions, please contact the instructor.

Course materials

Note, course content and course materials are made available by instructors solely for educational purposes and only for use by participants in the course. Any other use, or distribution, of the material, outside of fair-use exceptions of the Copyright act, requires explicit consent of the instructor.

Outline syllabus

This course covers topic in electricity and magnetism, leading to Maxwell's equations and electromagnetic radiation.

As part of this course we will cover:

- vector calculus, including the concepts of gradient, divergence and curl;
- Gauss's law in differential and integral form;
- the Laplace and Poisson equations;
- Ampere's law in differential and integral form;
- polarisation and magnetisation of materials;
- boundary conditions at interfaces between linear materials;
- Faraday/Lenz's law;
- electromotive force, Ohm's law, capacitance and inductance;
- Maxwell equations in vacuum and in matter;
- electromagnetic waves, the Poynting vector and wave polarisation;
- refractive index and waves at interfaces between medium.

Intended learning outcomes

Students should be able to:

- write down and manipulate Maxwell's equations in integral or differential form;
- translate physical descriptions of problems in electricity and magnetism into appropriate mathematical forms;
- identify appropriate coordinate systems for solving problems;
- derive appropriate boundary conditions at interfaces between materials;
- model problems in electromagnetism using a computer.
- justify and explain their approach to a problem in written or oral form.