PHYSICS 3500 (Electromagnetic Fields I) Course Syllabus (Fall 2025)

COURSE: Electromagnetic Fields I

INSTRUCTOR: Professor Qiying Chen, Department of Physics and Physical Oceanography
Memorial University
Office: C-3027; Email: qiyingc@online.mun.ca (within D2L/Brightspace)
http://www.mun.ca/physics/people/faculty/chen/php

CLASSROOM: C-4002

COURSE PAGE: Students should regularly check D2L/Brightspace (access via online.mun.ca).

CLASS SCHEDULE: 150 minutes of lectures per week, in-person lectures.
Tuesdays and Thursdays, 10:30 – 11:45 am (Slot 18).

OFFICE HOURS: Every Tuesday and Thursday, 12:00-13:00, C-3027. You are welcome to contact the instructor to arrange appointments on other time slots. Every effort will be made to respond to emails within 24 hours, with the exceptions of evenings, weekends and holidays.

COURSE COMMUNICATION: Email in D2L/Brightspace

COURSE TEXT: David J. Griffiths, Introduction to Electrodynamics, Fifth Edition, Cambridge University Press, 2024. Please note: The Fourth Edition of the textbook published by Pearson Education Inc. (2013) is also fine.

Calendar Entry: **PHYS 3500 Electromagnetic Fields I**
(https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/11/)
Electromagnetic Fields I
examines the laws of electrostatic and magnetostatic fields based on vector calculus and a local formulation. Topics covered include Gauss's law, potentials, energy and work, the multipole expansion, Laplace's equation and boundary conditions, linear dielectrics, electric polarization, electric displacement, capacitance, magnetic fields B and H, vector potentials, Lorentz force, magnetization and Maxwell's equations.
CR: Electrical and Computer Engineering 5700, the former Engineering 5812
PR: PHYS 2055 (Electricity and Magnetism) and Mathematics 3202 (Vector Calculus) or waiver approved by the instructor. Any interested student is welcome to discuss the course requirements with the instructor before registration.

TOPICS & SCHEDULE

Topic	**Text Chapter**	**Approximate Number of Lectures**
Overview and Introduction		1
Vector Analysis	1.1-1.6	3
Electrostatics	2.1-2.5	3
Potentials	3.1-3.4	3
Review 1		1
Midterm Exam Scheduled on October 23, 2025	Chapters 1-3	1
Electric Fields in Matter	4.1-4.4	3
Magnetostatics	5.1-5.4	3
Magnetic Fields in Matter	6.1-6.4	2
Electrodynamics	7.1-7.3 Selective	3
Review II		1

EVALUATION SCHEME:	Assignments:	25%
	Midterm Exam:	30%
	Final Exam:	45%
	No supplementary exam	

ASSIGNMENTS: There will be five assignments during the semester. The release and return of assignments will be conducted through Brightspace/D2L.

EXAMS: There will be one midterm exam and one final exam. Both the midterm exam and final exam are in-person closed-book examinations with the formula sheet provided.

CONTINUITY PLAN: In case of a disruption occurs, this course may transit to remote delivery following university decisions. Any subsequent adjustments (including the evaluation/marking policy) will be consulted with the students registered in this course, following the regulations of the university and approval by the administration of the university. Any course cancellations will be announced through Brightspace/D2L via the announcements in the course shell and the emails sent to the students.

MISSED WORK: In the case of missing the midterm examination due to illness or bereavement (see also Section 6.7.5 Exemptions from Parts of the Evaluation of the University Calendar), the corresponding 30% will be added to the final exam, which will be worth 75%.

GENERAL INFORMATION FROM THE UNIVERSITY:

Use of recording devices: The lectures and displays (and all material) delivered or provided in this course, including any visual or audio recording thereof, are subject to copyright owned by the instructor. It is prohibited to record or copy by any means, in any format, openly or surreptitiously, in whole or in part, in the absence of express written permission from instructor any of the lectures or materials provided or published in any form during or from the course.

Original work, completed wholly by the students, is expected to be submitted in this course. The use of an artificial intelligence tool like ChatGPT is not permitted.
Accommodations for Students with Disabilities: http://www.mun.ca/blundon/accommodations/
Student Code of Rights and Responsibilities: http://www.mun.ca/student/code/
Exemptions From Parts of the Evaluation:
http://www.mun.ca/regoff/calendar/sectionNo=REGS-0601#REGS-1949
Exemptions From Final Examinations: http://www.mun.ca/regoff/calendar/sectionNo=REGS-0628
Academic Misconduct: http://www.mun.ca/regoff/calendar/sectionNo=REGS-0748
Last day to drop a course without academic prejudice: see University Diary
https://www.mun.ca/university-calendar/diary-of-important-dates/

WELLNESS AND STUDENT SUPPORT:

Your wellbeing is important! There are many resources to support student wellness:
Student Life http://www.mun.ca/student/
Student Support, Health and Wellness, Academic Advising http://www.mun.ca/main/students/
Memorial University's Land Acknowledgement http://www.mun.ca/indigenous/