Physics 4500 (Electromagnetic Fields II) Course Syllabus (Winter 2019)

Course: Electromagnetic Fields II

Instructor: Prof. Qiying Chen, Department of Physics & Physical Oceanography, Memorial University of Newfoundland
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http://www.mun.ca/physics/people/faculty/chen.php

Office Hours: Every Monday, 13:00 – 14:00, Physics Help Centre, C3071;
Every Friday, 13:00 – 14:00, Room: C3027;
or contact instructor for other available time.

Class Schedule: 150 minutes of lectures per week.
Monday, Wednesday, and Friday, Slot 04 (11:00–11:50 am), C3067

Marking Policy:

Assignments	25 %
Midterm	30 %
Final	45 %

No supplementary exam

This course covers multipole expansions, electrostatic fields as boundary value problems, polarizability of molecules in dielectric media, Clausius-Mossotti relation, gauges. Electro-magnetic Waves: Poynting's theorem, reflection and transmission of electromagnetic waves, cavity resonators, wave guides. Electromagnetic Radiation: dipoles, antennas, quantum mechanics and electro-magnetic interactions. Selected topics in electrodynamics and applied electromagnetism.
(http://www.mun.ca/regoff/calendar/sectionNo=SCI-1481)

Prerequisites: Physics 3500 (Electromagnetic Fields I) and Physics 3820 (Mathematical Physics III) or waiver approved by the instructor. Any interesting student is welcome to discuss with the instructor on the course requirements before registration.

Textbook:

David J. Griffiths, Introduction to Electrodynamics, Fourth Edition, Prentice-Hall, Inc., 2013.

Topics & Schedule:

- Overview
- Introduction
- Review on Electrostatics
- Review on Magnetostatics
- Multipole Expansion
- Electrodynamics
- Conservation Laws
- Electromagnetic Waves I

- Review I
- Midterm test (1, tentatively scheduled on February 15, 2019, 11:00 – 11:50 am)
- Electromagnetic Waves II
- Waveguides
- Potentials and Fields
- Radiation
- Relativistic electrodynamics (if time permitted)
- Review II
- Final examination (2.5 hours, date to be decided)

Assignments: There will be five assignments during the semester.
Exams: There will be one midterm exam (close book) and one final exam. The students are permitted to bring the textbook only (Griffiths' Introduction to Electrodynamics) during the final exam – no lecture notes, assignments, or other materials.

Additional Note: In the case of missing the mid-term 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%.

Use of Recording Devices in Classrooms:

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Important General Information from the University:

It is the student's responsibility to acquaint themselves with these items. Please read:

3. Student Code of Conduct:
http://www.mun.ca/student/conduct/

6.8.2 Exemptions from Final Examinations:
http://www.mun.ca/regoff/calendar/sectionNo=REGS-0628

6.12 Academic Misconduct:
http://www.mun.ca/regoff/calendar/sectionNo=REGS-0748

Accommodations for Students with Disabilities:
http://www.mun.ca/blundon/accommodations/