Electricity & Magnetism PHYS 3200

Instructor Info ——

👤 Professor Ferroglia

🕐 Office Hr: Monday 9:00 - 10:00

📍 Pearl 411

ℹ️ https://www.citytech.cuny.edu/faculty/AFerroglia

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Course Info ———

⚡ Prereq: PHYS1442, MAT1575

📅 Mon. & Wed.

🕐 10:00 - 11:40

📍 N1023A

About ————

As one of the standard upper-level physics courses required by any BS programs in Physics, PHYS 3200 Electricity, and Magnetism is devoted to a detailed study of the laws of electricity and magnetism, by means of the appropriate mathematical tools acquired by the students in the Calculus sequence. Aside from providing students with the opportunity of applying and testing their mathematical and computational skills, this course provides a detailed description of the fundamental laws which are the basis of innumerable technological applications.

Syllabus - Spring 2022
Created on: 01/08/2022

Overview

An introduction to electrodynamics with applications to physical problems. Topics include electrostatics, magnetostatics, Maxwell's equations, electromagnetic forces, electromagnetic waves, radiation from accelerating charges and currents and special relativity.

Material

Online Resources

Electromagnetism, by David Tong, Professor at Cambridge University, available at
http://www.damtp.cam.ac.uk/user/tong/em/electro.pdf

Classical Electromagnetism, by Richard Fitzpatrick, Professor of Physics at The University of Texas at Austin, available at
http://farside.ph.utexas.edu/teaching/jk1/Electromagnetism.pdf

Lecture Notes. The course website with the lecture notes that will be discussed in class can be found at this link. Lecture notes do not replace, but complement the books

Grading Scheme

33.3%	Exam 1
33.3%	Exam 2
33.3%	Final Exam

Grades will follow the standard scale: A = 93-100, A- = 90-93, B+ = 87 - 90, B = 83-87, B- = 80-83, C+ = 77-80, C = 70-77, D = 60-70, F < 60.

Exam Policy and Homework

- All students are expected to connect on time for all lecture meetings and exams.
- Any student absent from an exam will be given a grade of zero for the exam unless he or she provides a doctor's note of explanation.
- Students will be allowed to prepare and use during the exam a handwritten, one-page letter format formula sheet.
- Homework problems will be assigned during the semester. Homework assignments solved correctly lead to extra credit points, that are then added to the exam grades. It is extremely important that students solve the homework problems and ask any problem-related question they might have to the instructor.

Technology Statement

Online class meetings (both lectures and labs) will be held using Blackboard Collaborate or Zoom. To communicate during the class, you need; a working microphone (built-in or external) connected to your computer/tablet and a working camera (built-in or external).

A smartphone is not recommended as a primary tool in the online class. It is technically possible to use a smartphone to take the class, however a typical smartphone's screen was found too small to show online materials, especially formulas and their annotations, in reasonable quality.

FAQs

? How do I study for this course?

! As usual it is crucial to read the book by following each calculation with pencil and paper while you read. The goal is to be able to derive each single equation in the chapters that we discuss in class. This kind of work takes time but it pays off in the end.

? Where do I find the lecture notes discussed in class?

! The course website with the lecture notes that will be discussed in class can be found at this link. Lecture notes do not replace, but complement the books

? Will homework be assigned?

! Problems will be assigned in almost every class meeting. The solution of some of the assigned problems will be discussed in each class meeting. While homework does not count toward the final grade, solving homework problems is absolutely necessary to prepare for the in-class exams.

? Where was Lagrange from?

! Lagrange was born in what is now Italy (in the city of Turin to be precise) in 1736. At the time that part of the world was part of the Kingdom of Piedmont and Sardinia. He moved to Berlin in 1766. Finally in 1786 he moved to Paris where he resided until his death in 1813. He became a French senator in 1799, and in 1802 he signed the act that annexed his fatherland Piedmont to France. He acquired French citizenship in consequence.

Class/Assignment Rules

You are encouraged to talk to each other in class and beyond, but your assignments need to be the result of your own work. Identical or very similar assignments are not acceptable. This is valid also for longer assignments and reports. Using online sources as inspiration for assignments is allowed but sources should be cited. Using large chunks of text from outside sources in reports is not allowed and will be considered plagiarism.

Academic Integrity

Students and all others who work with information, ideas, texts, images, music, inventions, and other intellectual property owe their audience and sources accuracy and honesty in using, crediting, and citing sources. As a community of intellectual and professional workers, the College recognizes its responsibility for providing instruction in information literacy and academic integrity, offering models of good practice, and responding vigilantly and appropriately to infractions of academic integrity. Accordingly, academic dishonesty is prohibited in The City University of New York (CUNY) and at New York City College of Technology (CityTech) and is punishable by penalties, including failing grades, suspension, and expulsion.

Diversity and Inclusivity Statement

The University respects individuals while acknowledging the differences among them. These differences include, but are not limited to, race, national-origin, ethnicity, religion, age, gender, sexual orientation, gender identity, disability, and socioeconomic status. However in order to create a vibrant academic, intellectual, and cultural environment for all, the University must move beyond representation to genuine participative membership. Thus, the University seeks to develop a community that is inclusive of all individuals and groups. Given CUNY's long history of proactive support for diversity and inclusion, it is uniquely positioned to build upon that strong foundation and serve as a national leader and model, exemplifying the benefits that accrue when diversity and inclusion are integral components of an institution' s educational philosophy and core mission.

Accessibility Statement

City Tech is committed to supporting the educational goals of enrolled students with disabilities in the areas of enrollment, academic advisement, tutoring, assistive technologies and testing accommodations. If you have or think you may have a disability, you may be eligible for reasonable accommodations or academic adjustments as provided under applicable federal, state and city laws. You may also request services for temporary conditions or medical issues under certain circumstances. If you have questions about your eligibility or would like to seek accommodation services or academic adjustments, please contact the Center for Student Accessibility at 300 Jay Street, Room L-237, Phone 718-260-5143 or `http://www.citytech.cuny.edu/accessibility/`.

Class Schedule

Week	Topic	RF Lectures	DT Lectures
1	Vector Calculus	-	Div, Grad and Curl
2	Maxwell's Equations	Ch 1 Maxwell's Equations	Ch 1 Introduction
3 to 5	Electrostatics	Ch 2 Electrostatic Fields	Ch 2 Electrostatics
6 to 8	Magnetostatics	Ch 3 Magnetostatic Fields	Ch 3 Magnetostatics
9 and 10	Electric Fields in Matter	Ch 4 Electrostatics in Dielectric Media	Ch 7 Electromagnetism in Matter
11 and 12	Magnetic Fields in Matter	Ch 6 Magnetostatics in Magnetic Media	Ch 7 Electromagnetism in Matter
13 and 14	Electrodynamics	-	Ch 4 Electrodynamics
15	Review and Final exam		

Learning Outcomes

- Discipline Specific:
    - Learn to calculate electric fields for various types of static charge distributions.
    - Learn properties of electric fields in matter.
    - Learn to calculate magnetic fields for various steady current configurations.
    - Learn properties of magnetic fields in matter.
    - Learn and apply computational and algebraic techniques to the solution of systems of equations.
    - Learn the significance of each of Maxwell's equations.
- General Education:
    - Upon completion of the course students should be able to apply the advanced mathematical techniques learned in calculus courses to real-life physical applications.
    - Explain phenomena observed in everyday life by applying the conceptual understanding electricity and magnetism.
    - Apply scientific investigation and inquiry to understand real-world events.
- Pathways:
    - Upon completion of the course students should be able to apply the advanced mathematical techniques learned in calculus courses to real-life physical applications.
    - Explain phenomena observed in everyday life by applying the conceptual understanding electricity and magnetism.
    - Apply scientific investigation and inquiry to understand real-world events.