Course Syllabus: PHYS 2326.001 Fall 2015

Course Information

Course Number/Section	PHYSICS 2326.001.15F
Course Title	Electromagnetism & Waves
Term	Fall 2015
Days & Times	Tuesdays and Thursdays 1:00pm-2:15pm SLC 1.102 First class meeting: August 25th

Professor Contact Information

Instructor	Dr. Lloyd Lumata
Office Phone	972-883-2850
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Office Location	PHY 1.904
Office Hours	TBD
Other Information	TA and their office hours: TBD

Course Pre-requisites, Co-requisites, and/or Other Restrictions

Prerequisites: PHYS 2325 (Mechanics) and MATH 2419 (Calculus II) or MATH 2414 (Integral Calculus) or equivalent. Students must register for Physics Lab II (PHYS 2126). No exceptions to these will be allowed without the instructor's and/or other advisor's permission. Familiarity with basic mathematics (including algebra, geometry, trigonometry and basic integral and differential calculus) is assumed.

Course Description

This course introduces the main concepts of electricity and magnetism, eventually showing how they are in fact facets of the same electromagnetic force, one of the four known fundamental forces of nature.

We start by considering static electric charges and the force between them, and then develop the concepts of electric field, electric potential energy and electric potential. The notion of capacitance, and of energy storage in an electric field is then considered. Then we allow charge to move, and introduce current and resistance. We also consider the motion of charged particles in electric and magnetic fields.

A moving electric charge, or an electric current, produces a magnetic field, and we see how these are related. Further, a time-varying magnetic field generates an electric current, and we examine how these are related too. We show how Maxwell's equations – some of the most important equations in physics – encapsulate the relationships between electric and magnetic fields, charges and currents, and we learn how electromagnetic waves originate and propagate.

Along the way, problems will be assigned or classroom examples will be presented that will demonstrate applications to physical systems. The physics that we will cover is fundamental to society, being at the heart of many biological processes and techniques used in medicine, and of numerous other fields such as wireless communication.

Student Learning Objectives/Outcomes

The primary objectives of the course are to gain an understanding of electromagnetism and its relevance to the real world, as well as to develop problem-solving skills. As a result of the course, the student is expected to

demonstrate an understanding of the key concepts of electricity and magnetism - the laws, theories and relevant findings - and to be able to apply this knowledge to problems.

Topics include:

- Electric Charge
- Electric Force
- Electric Field
- Coulomb's Law
- Gauss's Law
- Electric Potential Energy
- Electric Potential
- Capacitance and Dielectrics
- Electric Current and Resistance
- Direct Current Circuits
- Magnetic Field and Magnetic Force
- Lorentz force law for charged particles
- Electromagnetic Induction
- Faraday's Law
- Lenz's Law
- Maxwell's Equations
- Electromagnetic Waves

Recommended Textbook and Required Access Code
We will primarily follow UNIVERSITY PHYSICS, (preferably 13th Ed.; earlier versions are also fine) by Young and Freedman, publisher Pearson-Addison Wesley. If you are purchasing the book, make sure that it includes the student access kit in order to do online homework. If you already have the book and are not already registered, you will need to register at the URL www.masteringphysics.com so that you can access the homework web site for this class.

Mastering Physics is mandatory for the class. If not obtained with your text, you need to purchase the access codes online. You need to access the course ID "LUMATA2326" to complete the online homeworks. An e-text is also available online.

Assignments & Academic Calendar
Class announcements will be sent out on eLearning that is available on the UTD home page. Your UTD user NET ID and password will give you access to this. You are expected to check this site regularly, at least twice a week.

Homework assignments: Weekly homework assignments will start after the second class (August 27th), and are to be completed on www.masteringphysics.com

I will also give instructions at the first class meeting. These will be assigned usually on Thursday evenings and you will have about a week to complete the problems.

Exams: There will be two interim exams and a final exam:

Exam I – TBD
Exam II – TBD
Final exam – TBD by University

All exams will be in assigned rooms.

It is expected that a student will have a basic scientific calculator and writing implements. When requested, all books, notes, computers, programmable calculators, PDAs, smartphones (e.g. Blackberry, iPhone), cell phones, as well as all bags (backpacks, purses, etc.) are to be placed at the sides or front of the room during an exam. A student must produce his/her valid student identification card, Texas Driver's License or other valid form of photo ID if requested, in order to take any exam.

Grading Policy

Your course grade will be based on two interim tests plus the final exam and homework. The first test will count for 20% of your grade and the second test will also count for 20% of your grade. The final exam will count for 30% of your grade. Homework will count for 20% of your grade. For homework, some allowance will be made for missed assignments, with at least the lowest mark assignment being dropped. There will be quizzes given in class from time to time; these will also be a random check of your attendance. *There are no makeup quizzes*. Your quiz average (less at least the two lowest scores for quizzes) counts for 10% of your grade. Initial assignment of letter grades will follow the usual break points.

90-100	A (A+, A, A-)
80-89	B
70-79	C
60-69	D
Below 60	F

Homework……...……...…….….	20%
Short Quizzes/Attendance……	10%
Midterm Exam 1……...	20%
Midterm Exam 2……...	20%
Final Exam…….……...	30%
Total	100%

Course Policies

The format of the class is primarily a lecture. Texting or the use of laptop computers during lectures, except for note taking, is not permitted since this can be very disruptive to other students. Attendance is very important and I expect that as far as possible you will attend every class. You are responsible for all material covered in class as well as material covered in the text unless explicitly excluded. The class will start promptly at 1:00 pm and end at 2:15 pm.

No make up exams will be given, but do speak with me if there are extenuating circumstances regarding absence for exams. You will be required to produce a medical note or other supporting documentation.

Lloyd Lumata
24th August 2015

UT Dallas Syllabus Policies and Procedures

> The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus. Please go to http://go.utdallas.edu/syllabus-policies for these policies.

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.

To Students:

You are asked to do two quizzes as part of your introductory physics course. The quizzes consist of multiple choice questions and are useful to the department in gathering information about the effectiveness of our courses.

These quizzes are on one of the following two eLearning sites:

(MERGED) PHYS 1302 & 2326 - F15

(These eLearning sites might have slightly different names depending on the display settings that are selected in eLearning.) This site is for the electromagnetism classes (physics II).

No pens or pencils are needed *and no books, notes, calculators or communications devices are allowed*. ***Both quizzes must be taken in the Test Center at MC 1.304*** and a specialized browser (the Respondus Lockdown Browser) must be used. (This browser is installed on the computers in the computer lab.)

Your first quiz (pretest) will be available **from 8:30 am on Monday Sept 8 to 9:00 pm on Monday September 21st**.

- You need to reserve a seat in the Testing Center for this quiz at: www.utdallas.edu/studentsuccess/testingcenter. The Testing Center's operational hours are at http://www.utdallas.edu/studentsuccess/testingcenter/
- Your second quiz (posttest) will be available **from 8:30 am Monday Nov 9 to 9:00 pm on Friday Nov 20th**. You need to reserve a seat in the Testing Center as for the first quiz.
- A quiz will finish 50 minutes after you click 'Begin Assessment' (but the test might not even take that long). ***You must complete the test in a single interval of 50 minutes or less***.

Again, 2 grade points extra credit will be given to those who take both the pretest and the post test, and an extra 1 point added if you score 50% or higher in the post test.