Course Syllabus: PHYS2326.501 Fall 2018

Course Information

Course number/section: PHYS2326.501.F18
Course title: Electromagnetism & Waves
Days and times: Tuesdays and Thursdays 5:30pm-6:45pm SLC 1.102

Class begins Tuesday 21st August and ends Thursday 6th December.

Contact Information

Instructor: Dr Lindsay King
Office phone: 972 883 6743
Email: Lindsay.king@utdallas.edu
Office: PHY 1.910

Office hours:

TAs: Stanislav Cherepanov, Miyoung Choi, Matthew Fong, Cristhian Garcia, Brandyn Lee

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 engineering.

Student Learning Objectives/Outcomes

The primary objectives of the course are to gain an understanding of the fundamentals 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 conceptual and problems.

Topics include:

Electric Charges, Forces and Fields
Coulomb's Law
Gauss's Law
Electric Potential Energy and Potential
Capacitance and Dielectrics

Electric Current and Resistance
Direct Current (DC) Circuits

Magnetic Fields and Forces
Lorentz force law for charged particles

Electromagnetic Induction
Faraday's Law
Lenz's Law

Maxwell's Equations

Electromagnetic Waves

Required Textbooks and Materials

There is no required textbook, but we will primarily follow UNIVERSITY PHYSICS, 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.

If you do not purchase the textbook, you will need to purchase a key for mastering physics.

The homework access code to use will be EMKINGFALL18. This will become active by Tuesday 28th August. More details of the homework site will be announced in class.

Summary notes from the lectures will be posted on eLearning.

Note: you are responsible for taking notes during class, and any notes posted on eLearning are a supplement to your own.

Assignments & Academic Calendar

Class announcements will be sent out on eLearning, 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, every day!

Homework assignments: Weekly homework assignments will start on Thursday of the second week of class, and are to be completed on EMKINGFALL18 at

www.masteringphysics.com

Exams: There will be three tests:

Exam I – TBD

Exam II – TBD

Final exam – TBD

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:

(I) Three tests (75%) (Best, second best, lowest exam contribute: 40%, 25%, 10% of grade respectively)

(II) Homework (15%); some allowance will be made for missed assignments, with one assignment being dropped. Homework will be for attempt/completion, so please do the homework yourself, since there may be overlap with test questions!

(III) In class and online quizzes and activities (10%)

There will be no makeup exams, homework, or quizzes.

(IV) The pre- and post-test organized by Dr MacAlevey: 2% for completing both pre- and post-test, and 1% additional for scoring more than 50% in the post-test. No credit will be given for doing only one of the pre- and post-test.

At the end of semester, students will receive a letter grade that reflects performance on tests, homework, quizzes. Initial assignment of letter grades will follow the usual break points:

A=90.0% +

B=80.0 – 89.9999%

C=70.0 – 79.9999%

D=60.0 – 69.9999%

F=<60.0%

While some flexibility may be applied in assigning letter grades this should not be assumed.

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 supporting material unless explicitly excluded. The class will start promptly at 17:30 and end shortly before 18:45.

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.

Lindsay King 21st August 2018

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://provost.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.

Message To Students from Dr Mac Alevey:

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 the eLearning sites that include the name of your Exam Section.

Lecture Section	Instructor of Lecture section	Exam Section
PHYS 1301.001	Lunjin Chen	PHYS 1301.701 College Physics I
PHYS 1301.002	Kaloyan Penev	PHYS 1301.702 College Physics I
PHYS 2325.001	Mustapha Ishak-Boushaki	PHYS 2325.701 Mechanics
PHYS 2325.002	Bing Lv	PHYS 2325.702 Mechanics
PHYS 1302.001	Mark Lee	PHYS 1302.701 College Physics II
PHYS 1302.501	Kuei Sun	PHYS 1302.702 College Physics II
PHYS 2326.001	Lloyd Lumata	PHYS 2326.701 Electromagnetism and Waves
PHYS 2326.002	Russell Stoneback	PHYS 2326.702 Electromagnetism and Waves
PHYS 2326.003	Bob Glosser	PHYS 2326.703 Electromagnetism and Waves
PHYS 2326.501	Lindsay King	PHYS 2326.704 Electromagnetism and Waves

Students in Dr. Lunjin Chen's class have the exam section PHYS 1301.701 College Physics I etc.

(These eLearning sites might have slightly different names depending on the display settings that are selected in eLearning.)

If you haven't got a link to your Exam Section (one business day after you enroll in your lecture class) then there is a problem with your enrollment. Katrina Adams (katrina.adams@utdallas.edu) is the eLearning Manager and she can get you enrolled. (As an additional check, you can go to the assessments page of the site and you should see a sample quiz. This sample isn't the pretest or posttest but just exists to let you test your account. It is always available from anywhere using any browser.)

No pens or pencils are needed *and no books, notes, calculators or communications devices are allowed*. ***Both quizzes must be taken in the new Test Center*** on the ***first floor of the Synergy Park North 2 building (SPN2)***. The Respondus Lockdown Browser must be used and is installed on the computers in the Test Center.

Before reserving a seat in the Test Center, check your enrollment in the quiz section as follows.

1. The first quiz (pretest) will be available **Tuesday Sept 4th to Tuesday Sept 18th provided that the Test Center is open.** You need to reserve a seat in the Testing Center for this quiz at http://www.utdallas.edu/studentsuccess/testingcenter/index.html. (Instructions for reserving a seat in the Testing Center have been posted on the eLearning site for the quizzes.) This page also gives the times when the Testing Center is open. Tests are unavailable when the Test Center is not open or when the Test Center is fully reserved. The first quiz is your chance to tell us what you already know about the topics in your physics class. Avoid guessing at answers.

2. The second quiz (posttest) will be available **from Friday Nov 2nd to Friday Nov 16th provided that the Test Center is open**. You need to reserve a seat in the Testing Center as for the pre-test. Tests are unavailable when the Test Center is not open or when the Test Center is fully reserved. Avoid guessing at answers.

A quiz will finish 1 hour after you click 'Begin Assessment'. You must complete the quiz in a single interval of 1 hour or less.

Any credit for doing the test(s) will be decided by the instructor of your class.

Take care,

Paul MacAlevey