UPDATED AS OF MARCH 25, 2020
SYLLABUS IS PRELIMINARY AND SUBJECT TO CHANGE
PHYSICS 2326.501 ELECTROMAGNETISM AND WAVES
SPRING 2020

Class meeting: Tuesday and Thursday, 5:30pm to 6:45pm ONLINE USING E-LEARNING WITH BLACKBOARD COLLABORATE ULTRA. THIS IS AVAILABLE ON YOUR E-LEARNING HOMEPAGE MENU. The first class meeting is on Tuesday, January 14. The last class meeting is Thursday, April 30.
Instructor: Robert Glosser, PHY1.900. Phone (972) 883-2876, glosser@utdallas.edu
Office Hours: Tuesday and Thursday, 9:30 am to 11:00 or by appointment

Teaching Asst.: Bojana Ivanic bxi160030@utdallas.edu
Office Hours: TBA

SI (Supplemental Instructor): Drew Pierpont dwp170030@utdallas.edu
Office Hours: TBA

Recommended Text: **UNIVERSITY PHYSICS,** 15th edition, v. II, electronic edition or combined edition by Young and Freedman. Other editions, especially the 14th, are generally OK. If uncertain, check with me. If not available to you already, be certain you have available the student access kit for Mastering Physics and Learning Catalytics in order to do on-line homework as well as in-class quizzes. You will need to register for Mastering Physics at www.masteringphysics.com so that you can access the homework web site for this class.

Mastering Physics and Learning Catalytics for the 15th edition are mandatory for the class. Be certain that your Mastering Physics Package includes Learning Catalytics. If not obtained with your text, registration online requires a credit card. (If you have the Mastering Physics for the 15th edition, check with me.)

You may want to consider purchasing both Mastering Physics and the e-text on-line for this course for $119.99. The price includes Learning Catalytics.

As of the Fall Semester, the on-line cost for Mastering Physics alone is $69.99. This prices does not include Learning Catalytics but this can purchased for an additional $12 for 6 months or $20 dollars for 12 months. (If you have already paid $20 when taking PHYS 2325 (Mechanics), you should not have to pay to continue with this course.)

Objectives and Outcomes: The course is intended to develop a qualitative and quantitative picture as to how a few basic equations can explain electrical and magnetic phenomena as experienced in our scientific and daily life. Also, the course will describe how this knowledge will be put together to predict electromagnetic radiation. The outcome is to be able to apply this background and acquired problem solving techniques to problems related to the student's career choice in fields such as engineering or biomedicine. The measurement of the student's knowledge obtained from this course and his/her problem solving capability will be by the

exams. Further details are below under Summary of Class Objectives.

Class Announcements: Class announcements, videos, homework solutions and corrections will be found on e-learning 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.

Class Mechanics: The classroom format will be lecture, quizzes, demonstrations, where possible, answering student questions and working problems.

SI instruction: The SI Leader for this course is Drew Pierpont

SI sessions are free group study opportunities, scheduled two or three times per week. Sessions are facilitated by an SI Leader, who has recently taken the course and received a high final grade. Attendance is voluntary.
Prerequisites: PHYS 2325 (Mechanics) and MATH 2419 (Calculus II) or MATH 2414 (Integral Calculus) or equivalent. Student 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.)

Exams: Exam 3 and the Final will not be given at the Testing Center. Details to be arranged. Exam 3 is postponed.
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Exams will be CLOSED BOOK. It is expected that a student will have a basic scientific calculator and writing implements. *During exams, all books, notes, computers, programmable calculators, communicating calculators, smart-phones or equivalents, cell phones, as well as backpacks, purses, and watches etc. will not be brought into the Testing Center. A student will need to present his/her valid Comet card in order to take any exam.*
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Your course grade will be based on the two best of the three semester exams, the final, the survey quizzes, quizzes and your homework grade. Each of the two highest semester exams count for 20% of your grade. The Final counts for 32% of your grade. **No make-up exams or quizzes will be given**. 3% of your grade is based on the survey quizzes described below. Homework counts for 10% of your grade. Quizzes will be given intermittently and count for 15% of your grade.

Homework: Homework is graded and assignments will be made on-line in Mastering Physics. In order to do the homework, you must have access to the internet. The basic instructions are as follows:

a. Log on to <www.masteringphysics.com>
b. Click on REGISTER using the ACCESS CODE in the student access kit that came with your text and follow on-screen instructions. *The course ID is MPGLOSSER5563516.* Once you are registered, you will have access to your assignment package for the particular section being covered in class. For your student ID use the first 3 letters of your first name + the first 3 letters of your last name. Make sure the name you give the website matches your name of record.

c. You will have one week after assignment to complete it ending at just before midnight on the due day.
d. After the assignment is no longer available, the solutions to the appropriate problems in the text will be posted on e-learning. There is no makeup homework.
e. Homework counts for 10% of your final grade. Your homework average will be based on the total number of possible homework points with the following compensation: Allowing for missed assignments, at least 10% of the total possible homework points will be subtracted and your homework grade will be based on this lesser number of possible points.
Homework will be assigned online. Solutions will be available on **e-learning** accessible on the UTD home page after the assignment is due. The assigned homework will provide a basis for portions of the exams. ***The student is expected to work out the homework on a regular basis and is responsible for obtaining the solutions.***

Grading: At the end of the semester each student will receive a numerical grade that reflects their weighted scores on exams, quizzes and homework. Unless otherwise announced, no other factors enter into this numerical grade. Initial assignment of letter grades follows the usual break points (A = 90% and above, B = 80 to 89.9999%, C = 70 to 79.9999%, D = 60 to 69.9999%, F = less than 60%). While some flexibility may be applied in assigning break points, this should not be assumed.

CLASS QUIZZES
Quizzes may be given in the classroom or assigned outside of class and are designed to test primarily, conceptual topics of the chapter. These quizzes will count for 15% of your grade. Allowing for missed quizzes, at least 10% of the total possible quiz points will be subtracted and your quiz grade will be based on this lesser number of possible points.
We will be using Learning Catalytics which should be included in your Mastering Physics Package. Students must bring a smart phone or tablet or laptop to class in order to log into Learning Catalytics.

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SURVEY QUIZZES (This is administered by the Physics Department.)
Point assignment to be determined.

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 Survey Quiz.

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Note Section number for quiz is .703

(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 Quiz Section (one business day after you enroll in your lecture class) then there is a problem with your enrollment. Please send an email to (eLearning@utdallas.edu) you can get 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.)

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.

The survey quizzes are worth up to 3 points (3% of your grade). You will receive 2 points just for taking BOTH pre-and post- tests. If you score 50% or better on the post- test, you will receive 3 points. There is no credit for taking only one of the survey quizzes.

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PURPOSE OF THE COURSE

This course is devoted entirely to electricity and magnetism (and optics if time permits). We start from the basic concepts of electric charge and the force between them and then go on to develop the concepts of the electric field and electric potential. We learn about capacitance and energy storage in an electric field. At this point we allow charge to move from which we develop the notion of current and resistance. A current in turn intrinsically produces a magnetic field and we examine the force a magnetic field exerts on moving charges and learn how to relate a magnetic field to the current that produces it. Now we are in a position to describe the effects of time varying magnetic and electric fields. This leads us into Maxwell's Equations and electromagnetic waves.

The applications of this topic are fundamental to our society as it encompasses such matters as communication by electromagnetic radiation, functioning of our nervous system and operation of all electronic circuits.

MASTERING THE COURSE

There are some general principles that may prove helpful to you in mastering this course and, more generally, understanding what electricity and magnetism is all about and how it fits into the rest of science and technology.

First is the expectation that you come into the class with sufficient skill in mathematics. This includes algebra, geometry, trigonometry and basic integral and differential calculus.

Second it is assumed that you will work all the assigned problems, obtain solutions and seek help if clarification is needed. The assigned problems form a significant basis for exam problems.

Third and probably the most important principle is that you take all possible steps to master the ***CONCEPTS*** as they are presented in class and in the text. As we go through the course each new concept builds to some degree on the previous ones as well as concepts learned in Physics I (e.g.: work-energy, torque, vector and scalar products). Failure to master the

concepts early in the course bodes poorly for what comes later. This Physics class is not for spectators! While working homework problems is essential, it is also imperative that you take time to understand the applicable concept or concepts, problem by problem. Since the exams are closed book, necessary formulas and constants will be given but these can be helpful only if you understand the concepts. To this end, the instructor and TA are here to help you master these concepts.

CLASSROOM PROCEDURE AND DECORUM

The format of the class is primarily a lecture. At the same time I welcome questions or interruptions for clarification and discussion at any time during the lecture. In fact, there may be periodic breaks in the lecture in order to have class discussion on particular points. Texting or the use of laptop computers during lecture time except for note taking is not permitted. While attendance is not mandatory, I believe it is important, particularly with regard to the quizzes and I expect that you will attend every class. *You are responsible for all material covered in class as well as material covered in the text and on e-learning unless explicitly excluded.* The class will start promptly at 5:30 pm and end at 6:45pm.

Listed below are chapters to be covered:

Chap. 21. Electric Charge and Electric Field
Chap. 22. Gauss's Law
Chap. 23. Electric Potential
Chap. 24. Capacitance and Dielectrics
Chap. 25. Current, Resistance and Electromotive force
Chap. 26. Direct Current Circuits
Chap. 27. Magnetic Field and Magnetic Forces
Chap. 28. Sources of Magnetic Field
Chap. 29. Electromagnetic Induction
Chap. 30. Inductance
Chap. 31. Alternating Current (if time permits)
Chap. 32. Electromagnetic Waves
Chap. 33. The Nature and Propagation of Light (if time permits)
Chap. 34. Geometric Optics (if time permits)

SUMMARY OF CLASS OBJECTIVES

1. Students will be presented with a number of key concepts that lead to an understanding of Maxwell's Equations. The student is expected to demonstrate their understanding of these concepts on exams and quizzes.
2. Students will be able to apply each of the four Maxwell's equations to solve problems on exams and homework.
3. Students will be able to exploit solutions to the electromagnetic wave equation to demonstrate their understanding of wave propagation and polarization.

Student Conduct & Discipline

The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations which govern student conduct and activities. General information on student conduct and discipline is contained in the UTD publication, *A to Z Guide*, which is provided to all registered students each academic year.

The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the *Rules and Regulations, Board of Regents, The University of Texas System, Part 1, Chapter VI, Section 3*, and in Title V, Rules on Student Services and Activities of the university's *Handbook of Operating Procedures*. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations (SU 1.602, 972/883-6391).

A student at the university neither loses the rights nor escapes the responsibilities of citizenship. He or she is expected to obey federal, state, and local laws as well as the Regents' Rules, university regulations, and administrative rules. Students are subject to discipline for violating the standards of conduct whether such conduct takes place on or off campus, or whether civil or criminal penalties are also imposed for such conduct.

Academic Integrity

The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work.

Scholastic dishonesty includes, but is not limited to, statements, acts or omissions related to applications for enrollment or the award of a degree, and/or the submission as one's own work or material that is not one's own. As a general rule, scholastic dishonesty involves one of the following acts: cheating, plagiarism, collusion and/or falsifying academic records. Students suspected of academic dishonesty are subject to disciplinary proceedings.

Plagiarism, especially from the web, from portions of papers for other classes, and from any other source is unacceptable and will be dealt with under the university's policy on plagiarism (see general catalog for details). This course will use the resources of turnitin.com, which searches the web for possible plagiarism and is over 90% effective.

Email Use

The University of Texas at Dallas recognizes the value and efficiency of communication between faculty/staff and students through electronic mail. At the same time, email raises some issues concerning security and the identity of each individual in an email exchange. The university encourages all official student email correspondence be sent only to a student's U.T. Dallas email address and that faculty and staff consider email from students official only if it originates from a UTD student account. This allows the university to maintain a high degree of confidence in the identity of all individual corresponding and the security of the transmitted information. UTD furnishes each student with a free email account that is to be used in all

communication with university personnel. The Department of Information Resources at U.T. Dallas provides a method for students to have their U.T. Dallas mail forwarded to other accounts.

Withdrawal from Class
The administration of this institution has set deadlines for withdrawal of any college-level courses. These dates and times are published in that semester's course catalog. Administration procedures must be followed. It is the student's responsibility to handle withdrawal requirements from any class. In other words, I cannot drop or withdraw any student. You must do the proper paperwork to ensure that you will not receive a final grade of "F" in a course if you choose not to attend the class once you are enrolled.

Student Grievance Procedures
Procedures for student grievances are found in Title V, Rules on Student Services and Activities, of the university's *Handbook of Operating Procedures*.
In attempting to resolve any student grievance regarding grades, evaluations, or other fulfillments of academic responsibility, it is the obligation of the student first to make a serious effort to resolve the matter with the instructor, supervisor, administrator, or committee with whom the grievance originates (hereafter called "the respondent"). Individual faculty members retain primary responsibility for assigning grades and evaluations. If the matter cannot be resolved at that level, the grievance must be submitted in writing to the respondent with a copy of the respondent's School Dean. If the matter is not resolved by the written response provided by the respondent, the student may submit a written appeal to the School Dean. If the grievance is not resolved by the School Dean's decision, the student may make a written appeal to the Dean of Graduate or Undergraduate Education, and the deal will appoint and convene an Academic Appeals Panel. The decision of the Academic Appeals Panel is final. The results of the academic appeals process will be distributed to all involved parties.
Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations.

Incomplete Grade Policy
As per university policy, incomplete grades will be granted only for work unavoidably missed at the semester's end and only if 70% of the course work has been completed. An incomplete grade must be resolved within eight (8) weeks from the first day of the subsequent long semester. If the required work to complete the course and to remove the incomplete grade is not submitted by the specified deadline, the incomplete grade is changed automatically to a grade of **F**.

Disability Services
The goal of Disability Services is to provide students with disabilities educational opportunities equal to those of their non-disabled peers. Disability Services is located in room 1.610 in the Student Union. Office hours are Monday and Thursday, 8:30 a.m. to 6:30 p.m.; Tuesday and Wednesday, 8:30 a.m. to 7:30 p.m.; and Friday, 8:30 a.m. to 5:30 p.m.
The contact information for the Office of Disability Services is:
The University of Texas at Dallas, SU 22
PO Box 830688
Richardson, Texas 75083-0688

(972) 883-2098 (voice or TTY)
Essentially, the law requires that colleges and universities make those reasonable adjustments necessary to eliminate discrimination on the basis of disability. For example, it may be necessary to remove classroom prohibitions against tape recorders or animals (in the case of dog guides) for students who are blind. Occasionally an assignment requirement may be substituted (for example, a research paper versus an oral presentation for a student who is hearing impaired). Classes enrolled students with mobility impairments may have to be rescheduled in accessible facilities. The college or university may need to provide special services such as registration, note-taking, or mobility assistance.
It is the student's responsibility to notify his or her professors of the need for such an accommodation. Disability Services provides students with letters to present to faculty members to verify that the student has a disability and needs accommodations. Individuals requiring special accommodation should contact the professor after class or during office hours.

Religious Holy Days
The University of Texas at Dallas will excuse a student from class or other required activities for the travel to and observance of a religious holy day for a religion whose places of worship are exempt from property tax under Section 11.20, Tax Code, Texas Code Annotated.
The student is encouraged to notify the instructor or activity sponsor as soon as possible regarding the absence, preferably in advance of the assignment. The student, so excused, will be allowed to take the exam or complete the assignment within a reasonable time after the absence: a period equal to the length of the absence, up to a maximum of one week. A student who notifies the instructor and completes any missed exam or assignment may not be penalized for the absence. A student who fails to complete the exam or assignment within the prescribed period may receive a failing grade for that exam or assignment.
If a student or an instructor disagrees about the nature of the absence [i.e., for the purpose of observing a religious holy day] or if there is similar disagreement about whether the student has been given a reasonable time to complete any missed assignments or examinations, either the student or the instructor may request a ruling from the chief executive officer of the institution, or his or her designee. The chief executive officer or designee must take into account the legislative intent of TEC 51.911(b), and the student and instructor will abide by the decision of the chief executive officer or designee.
Off-Campus Instruction and Course Activities
Off-campus, out-of-state, and foreign instruction and activities are subject to state law and University policies and procedures regarding travel and risk-related activities. Information regarding these rules and regulations may be found at the website address given below. Additional information is available from the office of the school dean.
(http://www.utdallas.edu/Business Affairs/Travel_Risk_Activities.htm)

These descriptions and timelines are subject to change at the discretion of the professor.