SYLLABUS (*Preliminary*)
PHYSICS 3342
PHYSICS FOR BIOSCIENCE II
Fall 2008

Class meeting: Tuesday and Thursday, 2:30 to 3:45 pm in FN 2.102 (Kusch Auditorium). The first class meeting is on Thursday, August 21
Instructor: Robert Glosser, ECSN, Room 2.234. Phone: 972 883 2876,
glosser@utdallas.edu
Office Hours: Tuesdays and Thursdays, 3:45 to 4:45pm or by appointment.

Teaching Asst.: Angeline Burrell, ECSN, Room 2.806. Phone: 972 883 2867
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Recitations and office hours: to be arranged and by appointment (e-mail or call)

Text: **UNIVERSITY PHYSICS,** 12th Ed., by Young and Freedman. If you are purchasing the text for the first time, be certain it includes the student access kit in order to do on-line homework. If you already have the 12th edition and are not already registered, you will need to register at <www.masteringphysics.com>so that you can access the homework web site for this class. Registration online requires a credit card.
Class Announcements: Class announcements, homework solutions and corrections will be found on http://webct.utdallas.edu/ Your UTD user NET ID and password will give you access to this. You are expected to check this site twice a week.
Prerequisites: PHYS 3341 (Physics for Bioscience I) and MATH 2419 (Calculus II) or equivalent. Student must register for Physics Lab II (PHYS 1102) (No exceptions to this will be allowed without the instructor's and/or other advisor's permission.)
Exams: There will be three semester exams and a final.
Semester Exam test dates are:
Exam I-Tuesday, September 16, 2:30 to 3:45pm
Exam II-Tuesday, October 14, 2:30 to 3:45pm
Exam III-Thursday, November 6, 2:30 to 3:45pm
Final exam-Tuesday, December 16, 2:00 to 4:45pm
All exams in the classroom or other assigned rooms.

Exams and quizzes will be CLOSED BOOK. It is expected that a student will have a basic scientific calculator and writing implements. *All books, notes, computers, programmable calculators, communicating calculators, BlackBerrys or equivalents, cell phones, as well as 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 or Texas Driver's License (no other IDs are acceptable) if requested in order to take any exam or quiz.* Any student INVOLVED in cheating will be reported to the Dean of Students with the expectation of being dropped from the course with a grade of F in addition to any penalties administered by the Dean.

Your course grade will be based on the two best of the three semester exams plus the final exam, homework average and quiz average. Each of the highest two (out of three) semester exams counts for 25% of your grade. **No make up exams will be given**. The final exam counts for 30% of your grade. Homework counts for 10% of your grade and your quiz average counts for 10%.

Homework:
Homework is graded and assignments will be made in class. 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 MPGLOSSER46970.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 (ending nominally at 11:00 pm on that day but not allowing for DST) after assignment to work the problems.
d. After the assignment is no longer available, the solution to the appropriate problems in the text will be posted on WebCT. 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 less at least 10% of that total.

Homework will be assigned online. Solutions will be available on the Web http://webct.utdallas.edu/ 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.***

Listed at the end of this syllabus are the chapters to be covered. Assignments will be made in class and will consist of approximately 5-8 problems per class. From time-to-time additional special problems may be assigned.

Quizzes:

a. Quizzes will be given online on a regular basis. The quizzes are found in WebCT under ASSESSMENTS. Each quiz is assigned a day prior to a given class and the student will have until 2:00pm of that class day to work the quiz. Material will be based primarily on material covered in the previous lecture and/or material in the text in preparation for the lecture of that day. Once started, the student has one hour to complete the quiz. Only one attempt is allowed. Quiz results will be given after the quiz due date.
There are no makeup quizzes.
b. Your quiz average (less at least 10% of the total possible quiz points) counts for 10% of your grade.

Grading:

a. At the end of the semester each student will receive a numerical grade that reflects their weighted scores on exams, quizzes and homework. No other factors enter into this numerical grade. Because exams will typically contain bonus problems, it is possible for a student have a final numerical score of greater than 100%. 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. Past classes, where a significant fraction of the class received an A, the break point for an A (not an A-) was strictly 90%. Student with a numerical grade of 89 plus a fraction received a B+. This could apply to other grades as well. While a grade below 60% is considered an F, students who have made a significant effort in the class may be allowed to pass with a D- but this should not be assumed. Determination of break points for + and – grades depend on overall performance and for some grades there may be no award of + and/or – grades.

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PURPOSE OF THE COURSE

This course is devoted entirely to electricity and magnetism with applications to the biosciences. 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 effect of a time varying magnetic and electric fields. This leads us into Maxwell's Equations and electromagnetic waves. Along the way, problems will be assigned or classroom examples will be presented that will demonstrate applications to biological systems.

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 and quizzes are closed book, necessary formulas and constants will be given but these can be helpful only if you understand the 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. However cross conversations while I am lecturing or while another student is asking a question is rude and I view it most unkindly. 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 unless explicitly excluded.* The class will start promptly at 2:30pm and end at 3:45pm.

I look unkindly towards people who regularly turn up late or who leave in the middle of a lecture. Both are disruptive to the class. There are times when such situations are unavoidable in which case a word of explanation would be appreciated.

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.
2. Students will be able to describe laws, theories or findings basic to the electricity and magnetism.
3. Students will be able to apply Maxwell's Equations to obtain the electromagnetic wave equation.
4. Students will be able to apply the results of Maxwell's equations.

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/BusinessAffairs/Travel_Risk_Activities.htm)

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