

PHYS 4324: Advanced Electricity & Magnetism
Spring 2014

Instructor: Dr. Robert Bruntz

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Office Hours: Mon. + Wed., 2:00-3:00 PM, and by appointment

Section Information: PHYS 4324-001 (24027)

Time and Place of Class Meetings: Mon. + Wed., 4:00-5:20 PM, Science Hall, room 205

Description of Course Content: Electromagnetic phenomena based on Maxwell's equations and particle-field interactions.

Student Learning Outcomes: Students will be able to solve advanced problems involving electrodynamics, conservation laws, electromagnetic waves, potentials and fields, radiation, and relativistic electrodynamics, using advanced mathematics, such as differential, integral, and vector calculus, in order to gain physical understanding of electromagnetic phenomena.

Required Textbooks and Other Course Materials: *Introduction to Electrodynamics, 4th Edition*, by David J. Griffiths, published by Pearson.

Descriptions of major assignments and examinations: Homework will be assigned throughout the semester, with approximately one assignment due per week. There will be 2 midterm exams and one final exam. Students will be expected to turn in a notecard at the end of each class, based on that class's lecture or reading material.

Attendance: Attendance is not required, but is strongly recommended, as it has been shown to strongly affect student outcome. Students will be expected to turn in a notecard based on each class's lecture or reading material, whether they attend the class or not, as part of their grade.

Prerequisites: PHYS 3321 (Intermediate Electricity & Magnetism), which has as prerequisites PHYS 2311 (Mathematical Methods of Physics) and MATH 3318 (Differential Equations) or 3319 (Differential Equations & Linear Algebra).

Grading:

- Homework: 20%
- Midterm 1: 20%
- Midterm 2: 20%
- Final Exam: 35%
- Notecards: 5%

Students are expected to keep track of their performance throughout the semester and seek guidance from available sources (including the instructor) if their performance drops below satisfactory levels.

Expectations for Out-of-Class Study: Beyond the time required to attend each class meeting, students enrolled in this course should expect to spend at least an additional 9 hours per week of their own time in

course-related activities, including reading required materials, completing assignments, preparing for exams, etc.

Course Schedule: (29 class meetings, including 2 midterm exams)

Mon.	Wed.	Topic	Notes
January 2014			
13		Overview of class, review of previous material	
	15	Ch. 7 – Electrodynamics	
20		(none)	MLK Jr. Day holiday
	22	Ch. 7 – Electrodynamics	
27		Ch. 7 – Electrodynamics	
	29	Ch. 7 – Electrodynamics	
February 2014			
3		Ch. 7 – Electrodynamics	
	5	Ch. 8 – Conservation Laws	
10		Ch. 8 – Conservation Laws	
	12	Ch. 8 – Conservation Laws	
17		Ch. 8 – Conservation Laws and review for Exam 1	
	19	Exam 1	
24		Ch. 9 – Electromagnetic Waves	
	26	Ch. 9 – Electromagnetic Waves	
March 2014			
3		Ch. 9 – Electromagnetic Waves	
	5	Ch. 9 – Electromagnetic Waves	
10		(none)	Spring Break!
	12	(none)	Spring Break!
17		Ch. 9 – Electromagnetic Waves	
	19	Ch. 10 – Potentials and Fields	
24		Ch. 10 – Potentials and Fields	
	26	Ch. 10 – Potentials and Fields	
31		Ch. 10 – Potentials and Fields, and review for Exam 2	
April 2014			
	2	Exam 2	
7		Ch. 11 – Radiation	
	9	Ch. 11 – Radiation	
14		Ch. 11 – Radiation	
	16	Ch. 11 – Radiation	
21		Ch. 12 - Electrodynamics and Relativity	
	23	Ch. 12 - Electrodynamics and Relativity	
28		Ch. 12 - Electrodynamics and Relativity and review for Final Exam	
	30	Ch. 12 - Electrodynamics and Relativity and review for Final Exam	
May 2014			
5		(none)	Finals Week
	7	Final Exam	Final: 2:00-4:30 PM, SH 205

As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. –Robert J. Bruntz

Other possibly important dates:

- **January 29 – Census date**
- **March 28 – Drop deadline**
- **May 2 – Last day of classes**
- **May 3-9 – Final exams**
- **March 3-7 – APS March Meeting (Denver, CO)**
- **March 20-22 – Joint Texas APS/AAPT/SPS meeting (Abilene, TX)**
- **April 5-8 – APS April Meeting (Savannah, GA)**

Grade Grievances: Any appeal of a grade in this course must follow the procedures and deadlines for grade-related grievances as published in the current undergraduate catalog. For more information, see http://wweb.uta.edu/catalog/content/general/academic_regulations.aspx#19.

Drop Policy: Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance.** Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (<http://wweb.uta.edu/aao/fao/>).

Americans with Disabilities Act: The University of Texas at Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including the *Americans with Disabilities Act (ADA)*. All instructors at UT Arlington are required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of that disability. Any student requiring an accommodation for this course must provide the instructor with official documentation in the form of a letter certified by the staff in the Office for Students with Disabilities, University Hall 102. Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability or by calling the Office for Students with Disabilities at (817) 272-3364.

Academic Integrity: Students enrolled in this course are expected to adhere to the UT Arlington Honor Code:

I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.

I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

UT Arlington faculty members may employ the Honor Code as they see fit in their courses, including (but not limited to) having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents' Rule* 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University.

Student Support Services: UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include tutoring, major-based learning centers, developmental education, advising and mentoring, personal counseling, and federally funded programs. For individualized referrals, students may visit the reception desk at University College (Ransom Hall),

call the Maverick Resource Hotline at 817-272-6107, send a message to resources@uta.edu, or view the information at www.uta.edu/resources.

Electronic Communication: UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at <http://www.uta.edu/oit/cs/email/mavmail.php>.

Student Feedback Survey: At the end of each term, students enrolled in classes categorized as “lecture,” “seminar,” or “laboratory” shall be directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student’s feedback enters the SFS database anonymously and is aggregated with that of other students enrolled in the course. UT Arlington’s effort to solicit, gather, tabulate, and publish student feedback is required by state law; students are strongly urged to participate. For more information, visit <http://www.uta.edu/sfs>.

Final Review Week: A period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week *unless specified in the class syllabus*. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

Emergency Exit Procedures: Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit, which is located on the south side of Science Hall. To get there, exit this room through either door, follow the hallway to the right, use the stairwell to descend to ground level, then exit the building through the sliding doors. When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist handicapped individuals.

Library information:

Library Home Page.....	http://www.uta.edu/library
Subject Guides	http://libguides.uta.edu
Subject Librarians.....	http://www.uta.edu/library/help/subject-librarians.php
Database List.....	http://www.uta.edu/library/databases/index.php
Course Reserves.....	http://pulse.uta.edu/vwebv/enterCourseReserve.do
Library Catalog	http://discover.uta.edu/
E-Journals.....	http://liblink.uta.edu/UTAlink/az
Library Tutorials	http://www.uta.edu/library/help/tutorials.php
Connecting from Off- Campus.....	http://libguides.uta.edu/offcampus
Ask A Librarian	http://ask.uta.edu

