

## COURSE SYLLABUS

Physics 5303, Electromagnetic Theory, Spring 2009  
Tuesday and Thursday 8:00-9:20 a.m.

**Instructor:** Professor Walter L. Borst

**Office hours:** M, W, F 9:45-11:15 p.m., SC 11, Tel. 742-3864, e-mail: [Walter.Borst@ttu.edu](mailto:Walter.Borst@ttu.edu)

### Textbooks

Jackson, John David, *Classical Electrodynamics*; 3rd ed., John Wiley, 1999.

Griffiths, David J., *Introduction to Electrodynamics*, 3rd ed., Prentice Hall, 1999.

### Topics

Introduction to electrodynamics

*Maxwell's equations*: electrostatics, magnetostatics

*Maxwell's equations*: time-varying fields, Faraday's law

Energy, momentum, intensity, angular momentum in E- and B-fields

Electromagnetic waves, Fresnel's equations, wave guides

### Homework

Problems are assigned regularly from class notes and the textbooks. Please do the homework on your own. The homework is due at the beginning of class on the date given. Late homework will not be accepted except in an emergency.

### Term paper

A written term paper and oral presentation are part of the course. I expect you to find a topic closely related to the course content. Consult early with me and give me the *title and abstract* of your paper by the due date - see calendar. Also, submit an *outline of the paper* according to the calendar. The paper should follow the *APS style guide*, including a title, introduction, results and discussion, conclusion, figures, tables, and bibliography. Please stay in close contact with me about your paper during the semester. Send the finished paper by e-mail to me and fellow students as PDF as well as MS Word files (.doc extension - not .dox!), **at least two days before your presentation**. Also give a paper copy to me before the presentation. During the presentation, show only the highlights on overhead transparencies or a computer projector. Do not read text from the projector screen - speak freely! Set up all equipment before class time and verify that it works! Practice your talk to last 30 minutes. Questions from the audience are extra.

**The examinations** are closed books. They cover lecture notes, homework, and the textbooks, the latter to the extent discussed. Bring with you a calculator without physics content and a mathematical formula sheet of your choice. Take good *lecture notes*, as this is essential for success in the course.

**No make-up examinations** will be given. In a serious emergency, please contact me to find out how a missed grade will be determined.

**Attendance required**, except for excused absences. Otherwise, -1% off the course total for each unexcused absence.

### Grades

100-A-85-B-70-C-55-D-40-F-0

Two examinations: 15% each; final examination 20%; homework 30%; term paper 20%.

**Dates:** See the attached **Calendar**.

**Academic honesty:** Academic dishonesty will not be tolerated and will be treated according to the rules outlined in the Student Handbook.

**Course objectives and expected learning outcomes:**

1. Know and apply the fundamentals of classical electrodynamics (Maxwell's equations).
2. Be able to use these principles elsewhere when appropriate.

**Methods for assessing the expected learning outcomes:**

1. Examinations and grades
2. In-class questions and answers
3. Class discussions
4. Feedback from students after leaving TTU.

**Disability:** Any student who because of a disabling condition may require special arrangements in order to meet course requirements should contact the instructor as soon as possible so that the necessary accommodations can be made. The student must present appropriate verification from Access Tech. No requirement exists that accommodations be made prior to completion of the approved university procedure.

**CALENDAR** for Physics 5303, Spring 2009 (Dr. Walter Borst)

<b>M</b>	<b>T</b>	<b>W</b>	<b>Th</b>	<b>F</b>	<b>S</b>
			1/8		
	1/13		1/15		
	1/20		1/22 <b>Hwk 1 due</b>		
	1/27 <b>Term paper topic, abstract due</b>		1/29		
	2/3		2/5		
	2/10 <b>Examination 1</b>		2/12		
	2/17		2/19		
	2/24		2/26		
	3/3		3/5		
	3/10 <b>Term paper outline due</b>		3/12		
	3/17 <b>Spring vacation</b>		3/19 <b>Spring vacation</b>		
	3/24 <b>Examination 2</b>		3/26		
	3/31		4/2		
	4/7		4/9		
	4/14		4/16 <b>Paper presentations</b>		
	4/21 <b>Paper presentations</b>		4/22 <b>Paper presentations</b>		
	4/28 <b>Paper presentations</b>				
	5/5		<b>Final examination 7:30-10:00 a.m.</b>		