

## Electricity and Magnetism II

PHYS 421G

Fall Semester, 2006

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Days: Monday, Wednesday, Friday

Time: 1:00 p.m. – 1:50 p.m.

Location: CURENS 336

**Overview:** This is the Electricity and Magnetism II course for physics majors at the advanced undergraduate and graduate level. Tentative list of topics to be covered includes *Maxwell's equations in matter, electromagnetic waves in media, reflection and refraction of electromagnetic waves, wave guides, radiation of waves.*

**Objectives:** The purpose of this course to provide physics students with a solid knowledge of selected topics in classical theory of Electricity and Magnetism that are usually left out from the corresponding introductory courses.

**Text book: Introduction to Electrodynamics (3rd edition) by David J. Griffiths.**

**Attendance policy:** Attendance is expected although not mandatory. Students are responsible for all material presented in class, all homework, and for all changes to the schedule or plans which are announced in class.

My office is **Currens 305**. My office **telephone** number is **309-298-2743**. You are welcome to call me at my office at any time. There is a voice mail if I am not available. My **e-mail** address is [I-Shovkovy@wiu.edu](mailto:I-Shovkovy@wiu.edu). I read e-mail daily.

**Office hours:** Tentatively, these will be on Mondays and Wednesday from 4:30 p.m. to 6:00 p.m. In addition, you can make appointments with me.

**Prerequisites:** PHYS 320 and PHYS467.

**The final grade** for this course will be based on weekly homework assignments, two mid-term examinations, and a final examination. My default plan is to use the following table for determining the maximum number of points for each category:

|                          |             |
|--------------------------|-------------|
| weekly homework          | 300         |
| 1st mid-term examination | 200         |
| 2nd mid-term examination | 200         |
| final examination        | 300         |
| <b>TOTAL</b>             | <b>1000</b> |

together with the following **grade ranges**:

**A** (850-1000 points), **B** (700-849 points), **C** (550-699 points), **D** (400-549 points), **F** (<399 points)

**Homework** will usually be assigned every week and should be handed in the following week before the class. In general, late homework will not be accepted. Approximately 2 out of 3 problems will be selected randomly for grading, and each problem will be graded on a scale from 0 to 15. At the end of the semester, there will be approximately 24 graded problems. I plan to use the best 20 in computing your homework score.

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### Tentative schedule

The exact schedule for lectures and examinations will depend on how long it takes to cover the material. The following is my best guess as of now (August 2006). Please note that the mid-term exams are tentatively scheduled for Wednesdays, **September 27** and **November 1**. The mid-term exams will each have two problems to be solved in class and two problems to be taken home. The maximum score for each problem will be in the range between 40 and 60 points. The answers without solutions will not be accepted. The take-home questions of the mid-term exams will be due on Fridays, **September 29** and **November 3**, respectively, by the beginning of the class (i.e. 1 p.m.). The final examination is scheduled for Wednesday, **December 13**, 1:00 p.m. – 2:50 p.m. All exams are open book and open notes. There will be no make-up exams.

| Dates                |               | Tentative description of topics to be covered  |
|----------------------|---------------|--|
| from                 | to            |  |
| Aug. 21, 2006        | Sep. 25, 2006 | Chapters 7.3 and 8: Maxwell's equations in matter, Conservation laws   |
| <b>Sep. 27, 2006</b> |               | <b>1st MID-TERM EXAMINATION</b>  |
| Sep. 29, 2006        | Oct. 30, 2006 | Chapter 9: Electromagnetic waves   |
| <b>Nov. 1, 2006</b>  |               | <b>2nd MID-TERM EXAMINATION</b>  |
| Nov. 3, 2006         | Dec. 8, 2006  | Chapters 10 and 11: Potentials and fields, Radiation and, if time permits, The Special Theory of Relativity (Chapter 12.1) |
| <b>Dec. 13, 2006</b> |               | <b>FINAL EXAMINATION</b>   |

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