

Instructor: Cass Sackett

About the course:

- Intermediate-level coverage  
(graduate and undergraduate)
- Cross-disciplinary  
(physics, chemistry, engineering, math, ...)

1

Web Page:

<http://galileo.phys.virginia.edu/classes/531.cas8m.fall05>

- lecture notes
- homework assignments and solutions

Textbook: Hecht *Optics* 4th edition

(3rd edition probably OK, but not supported)

Text is optional:

We'll follow it for some of course, not all

Text has much more information than lectures

Supplemental texts in Physics library

Use for more help, further reading

2

## Prerequisites:

- Introductory E&M course.
- Mathematical techniques:
  - Matrices and vectors
  - Calculus
  - Differential equations
  - Complex numbers (review in class)
- Computer program for matrices, complex numbers  
Suggestions: Matlab, Mathematica, MathCad.  
I'll use Matlab.

3

## Grading:

- 40% Homework
- 50% Exams (midterm + final)
- 10% Participation

Graded on graduate course scale:

Average = B+/A-  
Unsatisfactory = C  
Abysmal = F

4

### Homework:

- Eleven assignments, see schedule.
- Usually due Tuesdays

Drop one assignment.

### Exams:

- Midterm: take home, 10/4 to 10/11
- Final: in class, 12/9

Weight better exam 30%, worse one 20%

5

### Participation:

- Lecture notes posted before class.
- Notes contain discussion questions. I'll call on students to answer these during class.
- No penalty if you're not here, but need to answer at least one question during semester.
- Passing grade if answers are satisfactory.

Higher grade for:

- providing more insightful answers
- asking insightful questions
- finding errors in lecture notes

6

## Sharing Work

### DO:

- Work together on homework problems.
- Study together for exams.

### DON'T:

- Copy another student's assignment.
- Discuss problems during exams.

Reminder: all assignments and exams are implicitly pledged to follow these rules.

7

## Office Hours

Instructor: Monday 1–3 PM

Mostly, help with homework

### Suggestions:

- Do what you can before coming
- Send one person from your study group
- If confused about a concept, schedule an appointment

8

## Content:

Course schedule available online

### Major Topics:

- Theory of electromagnetic waves
- Geometrical optics
- Fourier transform methods
- Interferometry and coherence
- Polarization and quantum optics