

Instructor: James Jacobs  
Office: Science Complex. Room 119.  
Phone: 243-4986 or 243-4950  
Text: *Fundamentals of Physics*  
by Halliday, Resnick and Walker. Sixth Edition. Chapters 19 through 37.  
Optional Text: *Quick Calculus* by Ramsey and Kleppner. Second Edition.  
Lectures: Mo,Tu,We,Th,Fr, 1:10-2:00 PM. SC Room 131.  
Lab: We,Th, 3:10-5:00 PM. SC Room 225 or 229.  
Office Hours: Right after class (short questions). And by Appointment. Regular hours TBA.  
Web site: [www.physics.umt.edu/~jacobs/Course\\_Materials/PH222\\_01/phys222\\_01.html](http://www.physics.umt.edu/~jacobs/Course_Materials/PH222_01/phys222_01.html)

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**Homework:** I will recommend 10-20 problems per chapter to be worked out carefully by each student which will *not* be collected. In order for students to check their work, solutions to these problems will be posted on the course web site. In addition, 1 or 2 extra problems per chapter will be assigned in class, collected, graded and returned to students. These problems will be graded not only for arriving at the correct result, but for the clarity and completeness of the solution process. Late homework assignments will not be accepted. If you miss a class, be sure to find out if there was an assignment. Solutions for these assignments will be posted outside my office.

**Exams:** There will be 4 in-class exams given during the semester (see schedule on page 2). Since each new topic will build on all previous concepts, a general working knowledge of previous material will be expected on all exams. The exams will be closed book except for a calculator and one 3×5 index card of notes that each student must prepare for themselves. Solutions to the exams will be available from the web site. Make-up exams will be given only in extreme situations and must be arranged IN ADVANCE. Please do not miss any exams. The final exam is comprehensive and will be held on Wednesday, May 16<sup>th</sup>, from 3:20 PM to 5:20 PM. Note cards from mid-term exams may be used on the final.

**Laboratory:** Each student is expected to complete nine two-hour laboratorys during the semester (see schedule on page 2). *Failure to complete and hand in at least seven of these labs will result in the student failing the course regardless of the grades on exams or homework.* In preparation for the lab portion of the course, you should go to the course web site to download two documents. One is the *Laboratory Report Guide*, which gives instructions on what to include in the lab report and how to present your results. Secondly, you should download a copy of *Errors and the Treatment of Data*, which explains how to handle error analysis, graphing, and other key issues that come up while writing labs. Each week, a few days before your lab, you should download and print a copy of the current lab to bring with you to your lab meeting. Students are expected to have read the instructions prior to arriving at the lab, and may be asked to write a brief pre-lab assignment. Lab preference forms will be handed out on the second day of classes. Lab Reports are due at the next lab meeting except for Lab 9 which will be due on Friday, May 11 by 3:00 PM (No late labs will be accepted after this time).

**General Remarks** This will be an intensive course; we will cover 20 chapters in 14 weeks (see schedule on the following page). Be sure to keep up on reading assignments and problem assignments. Drop/Add deadline is March. 12<sup>th</sup>. I will sign no drops after this date without EXTREME circumstances. Prerequisite to this course is PHYS 221 (or equivalent) and a *working* knowledge of college algebra, trigonometry and differential calculus. Co-requisite to this course is Math 153 (integral calculus) or equivalent.

### Grading

In class mid-term exams:	44%	(4 @ 11% each)
Homework:	12%	( $\approx$ 15 @ 0.8% each)
Lab reports:	14%	(10 @ 1.4% each)
Final exam:	30%	(comprehensive)

**Tentative Schedule – Topics**

Note that the lecture schedule is tentative, but the exam dates are firm.

Week:	Chapters	Topics	Labs	Exams:
Jan 29–Feb 2	Ch.19,Ch.20	Temp, Heat, First law	NO LAB.	
Feb 5–9	Ch.20,Ch.21	Thermodynamics, Entropy	Lab 1	
Feb 12–16	Ch.22,Ch.23	Electric Charge Fields.	Lab 2	
Feb 20–23	Ch.24,Ch.25	Gauss' Law	NO LAB	Exam 1 Tues. Feb 20
Feb 26–Mar 2	Ch.25,Ch.26	Electric Potential	Lab 3	
Mar 5–9	Ch.27,Ch.28	Circuits	Lab 4	
Mar 12–16	Ch.28,Ch.29	Magnetic Fields	NO LAB	Exam 2 Fri. Mar 16
Mar 19–23		Spring Break	NO LAB	
Mar 26–30	Ch.29,Ch.30	Magnetism	Lab 5	
Apr 2–6	Ch 30,Ch.31	Induction	Lab 6	
Apr 9–13	Ch.32,Ch.33	Maxwell's Equations	Lab 7	
Apr 16–20	Ch.34,Ch.35	EM Waves Images	NO LAB	Exam 3 Tues. Apr. 17
Apr 23–27	Ch.35,Ch.36	Ray Optics	Lab 8	
Apr 30–May 4	Ch 36,Ch.37	Physical Optics	Lab 9	
May 7–11	Ch.38 (Time Permitting)	Relativity/ Review	NO LAB	Exam 4 Tues. May. 8
May 14–18		Final's Week	NO LAB	Final Exam Wed. May 16 3:20 PM - 5:20 PM