

UNIVERSITY OF MARYLAND

Physics 420 Fall 2005,

Principles of Modern Physics

Prof. B. L. Hu

Lectures: Mon Wed 4-5:15 pm in Physics Rm 0405

TA: _____ Phone: _____ Email: _____ Office Hrs: _____

Prof. Hu's Office: Z-4209, Phone: 405-6029, E-mail: hub@physics.umd.edu, By appointment

Required Text: R.A. Serway, C. J. Moses and C. A. Moyer (SMM), *Modern Physics 3rd Edition* (Thomson) ISBN 0-534-49339-4

Theme An introduction to the theory of special relativity and some elementary statistical physics will be presented. But the centerpiece of the course is quantum mechanics. We shall discuss its basic principles and applications to important branches of modern physics.

Reading: To enhance your comprehension of the lectures, try to read the assigned material before each lecture. This will enable you to pay special attention to those parts you can't fully comprehend in your first reading. Feel free to ask questions in class on the course material.

Homework: Counts towards 20% of your course grade. There is a total of about 90 problems distributed in 9 homework sets. The worst-scored 10 problems will be discarded before your HW score is calculated and normalized to 100 points. The assigned problems and due dates (usually on Mondays) will be announced in class and updated on the course webpage. The best way is to do the assigned problems in each section after you finish studying that section. Solutions will be posted on the due date at 6pm. Do try to work the problems out on your own. Don't just read the solutions. The difference will show in your exam performance.

Exams: There will be one midterm exam counting 150 points and a final exam counting 250 points, both closed book. The exams are likely to contain one or more problems based on the assigned homework problems. (In the unlikely event the campus is closed on an exam day, the exam is automatically rescheduled for the next class day.) The final exam date and place will be announced in mid-semester. Every student must take the final exam to receive a course grade. If you know that you cannot take an exam for certified medical or university duty-related reasons, you have to give the instructor a written notice well in advance and discuss remedial possibilities. There is no scheduled make-up exam. So please be sure you don't miss them.

Course Grade: Your course grade will be based on a point count as follows:

Midterm exam (tentatively scheduled on Oct. 24)	150
Final exam	250
Homework	<u>100</u>
Total	500

Topics number of **lectures** (may vary upon your feedback) **Reading:** Chapters in SMM

1. Special Relativity	4		Ch 1, Ch 2.1 –2.4
2. Quantum Theory of Light	2		Ch 3
3. Early quantum physics: Bohr Atom		2	Ch.4,
4. Matter (de Broglie) Wave	2		Ch 5
5. Quantum mechanics: 1D	3		Ch 6, Midterm up to here
6. Tunneling	2		Ch.7
7. Quantum mechanics: 3D	4		Ch 8
8. Atomic Structure	3		Ch 9
9. Statistical Physics	3		Ch 10
10. Molecules, Solids, Lasers	3		Ch. 11, 12

Final Exam is Comprehensive, but with more course material after the mid-term exam