

PHY 362
Atomic and Molecular Physics
Syllabus Fall 2007

MWF 1110-1200 LL 512

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Topics covered in this course. We will discuss those parts of quantum mechanics that lead to the description of a particle in a potential, of atoms, and of molecules. The new concepts introduced and discussed will be the Schrödinger equation, wavefunctions, eigenvalues and eigenfunctions, spin, angular momentum, and Pauli's principle. Hence, the course is a basic introductory course that develops the most basic tools while at the same time explaining the fundamental structure of atoms and how they can bind with each other to produce molecules.

Textbook. Robert Eisberg, Robert Resnick, "Quantum Physics of Atoms, Molecules, Solids, Nuclei, and Particles". Wiley 1985. ISBN: 978-0-471-87373-0. You must have access to this book. The course will follow it, and many of the homework problems will come from it. This course will mainly address the material in Chapters 1-4 (you should already know most of this), Chapters 5-10, and Chapter 12.

Reading Assignments may be given from one week to the next, and are necessary in order to be able to understand and make the most of the lecture that will follow, and to do quizzes or homeworks.

Grading. There will be *homeworks*, short *quizzes*, a *mid-term exam*, and a *final exam*. Exams will contribute at least 50% to the final grade, Quizzes will contribute 30%, and Homeworks will contribute 20%. Within the exam grade, the midterm grades will be averaged with the final grade if they *improve* the final grade.

A note about quizzes and homeworks. *Quizzes* are simple, 5-minute questions that you will answer in writing in class, from time to time. Quizzes will be graded from 0 (if you are not there or do not write anything) to 3 (if everything is perfect). Only the top 70% will contribute to the final grades. Quizzes will focus on basic understanding of the most essential concepts. Use them as your guide: if you notice that you don't do well in quizzes, then it means that you are falling behind and that you are missing something essential. *Homeworks* are obviously very important because it is only by solving them that you will exercise the new tools that you are learning. It is the same as athletics, without exercise you cannot be good... For homeworks, I will give 1 point for an attempt to solve a problem, 2 points for a more complete discussion of a correct solution, and 3 points if the solution is complete and satisfying.

Accommodations for Students with Disabilities: If you have a disability for which you are or may be requesting accommodations, please contact both your instructor and the Office of Academic Support Services, University Center C212 (610-758-4152) as early as possible in the semester. You must have documentation from the Academic Support Services office before accommodations can be granted.