Physics III: APHY240, Autumn 2016, class number 7662
Monday-Wednesday 2:45-4:05 P.M. Physics 229

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http://www.albany.edu/physics/mszydagis.shtml, TA & Grader: Qinglin Li (qli20@albany.edu)
Office Hours: Tu and Th 11:00–1:00, Physics 312 or by appointment

Text: Modern Physics for Scientists and Engineers by S.T. Thornton and A. Rex, 4th OR 3rd Edition*

Course Description: An introduction to the kinetic theory of gasses, thermodynamics and its laws, Einstein’s theory of special relativity, quantum mechanics, and the atomic nature of matter. (We will also be discussing wherever possible some of the modern applications resulting from these areas of physics.)

General Education Category: Disciplinary Perspectives: natural sciences

See Undergraduate Bulletin p. 53 for general criteria governing General Education courses and specific learning objectives for Natural Science General Ed courses (natural phenomena, scientific method, social impact)

The following is a tentative course plan; it is natural to fall behind or get ahead and adjust topics

Week / Dates  Topic or Chapter (NOTE: Two at a time! Separated by semicolon) EXAMS ARE ON MONDAYS

Aug 29 and 31: Introduction and Temperature (outside book); 1st law of Thermodynamics (outside book)
Sep 5 and 7:  NO CLASS; 1st law of Thermodynamics (outside book) and Kinetic Theory of Gases (outside)
Sep 12 and 14: Kinetic Theory of Gases (outside); Entropy and 2nd law of Thermodynamics (outside)
Sep 19 and 21: 2nd law of thermodynamics (outside)
Sep 26 and 28: Exam 1 (Temperature, 1st Law, Kinetic Theory of Gases); Relativity (Ch. 2)
Oct 3 and 5:  NO CLASS; Relativity (Ch. 2)
Oct 10 and 12: Experimental Basis of Quantum Mechanics (Ch. 3); NO CLASS
Oct 17 and 19: Finish Ch. 3, Structure of Atom (Ch. 4); Wave Properties and QM, Part I (Ch. 5)
Oct 24 and 26: Exam 2 (Thermo, Ch. 2-4); QM, Part I (Ch. 5)
31 and Nov 2: QM Part I (Ch. 5); QM Part II (Ch. 6)
Nov 7 and 9:  QM Part II (Ch. 6); Structure of Atoms, revisited – Ch. 7 & 8
Nov 14 and 16: Structure of Atoms, revisited – Ch. 7 & 8
Nov 21 and 23: Statistical Mechanics (Ch. 9); NO CLASS (Happy Turkey Day!)
Nov 28 and 30: Exam 3 (Quantum Mechanics & Stat. Mech., Ch. 5-9); Lasers/Superconductivity (Ch. 10)
Dec 5 and 7:  Atomic Nuclei (Ch. 12 and 13); Lasers/Superconductivity (Ch. 10)
Dec 12 and 14: Particle Physics (Ch. 14) and Contemporary Topics; NO CLASS (Reading Period)
Dec 19  Final Exam (3:30PM – 5:30 PM) in same room that the class takes place in. Comprehensive!

There is a zero-tolerance policy on cheating and plagiarism. If you choose to engage in such activities, it would result in being dropped from the course with a failing grade, with me notifying the Dean of Undergraduate Studies, and expulsion would be likely.

There will be three 80-minute exams and a final exam (cumulative). The tentative dates for the exams are: Sept 26, Oct 24, and Nov 28 (first day back from break). The final exam takes place Mon., December 19th.

Your grades will be determined as follows:
1.5-hour exams  45% (15% for each)
Homework  15%
Final exam  25%
Class participation  15% (Explaining answers to example problems during class; asking questions)
**Classroom Conduct:** While you are in this class, electronic devices are prohibited – except for notetaking on a laptop computer or a tablet device. Absolutely no texting, e-mailing, or web surfing is allowed, on a smartphone or a comparable device.

**Homework:** Problem sets, containing problems both from the textbook plus outside, will generally be assigned every Wednesday, due at the start of class on the date specified on the homework, usually the following Wednesday, and are not accepted late under any circumstances, nor electronically such as by scanned e-mail attachment. Every step you needed to take in solving the homework problems must be shown. Writing down of only the final answers is not considered acceptable – err on the side of caution in detailing what might seem trivial.

You are permitted to form study groups to work on the homework. This is even recommended, as long as you still turn in your own work. What this means is that the members of a group should not just be copying all of the steps and answers verbatim from one group “leader.” If you are planning on only learning how to do problems identical to those found on the homework and expecting them to appear on the exams just with different numbers, then do not expect good performance on exams, which comprise nearly half of your grade when added together. However, homework does enforce lecture and text material and serves as exam preparation. Problems will be VERY SIMILAR.

**Absences:** I understand a medical emergency and personal or family difficulties can sometimes prevent you from attending class, potentially leading to missing exams. Unless something occurs literally on the day of class, please speak with me *ahead of time, if at all possible* so we can formulate a plan. University policy: [http://www.albany.edu/health_center/medicalexcuse.shtml](http://www.albany.edu/health_center/medicalexcuse.shtml)

Note that leaving early / arriving late hurts your own participation and learning, but is disruptive to all.

**Website:** Supplements and lecture slides, as well as solution sets to exams and homework, and the homework assignments themselves, will appear on [http://www.albany.edu/physics/phy240.shtml](http://www.albany.edu/physics/phy240.shtml)

* The 4th and 3rd editions of the textbook are very similar, but problems at the end of each chapter may differ (making usage of the course website all the more critical for all of you, in terms of checking over the exact wording of each homework problem). You may choose to get the older edition if it less expensive (not guaranteed), and although identicalness to the newer one is not assured, it *should* be adequate for the purposes of this course. Bring any issues noticed to my attention for speedy resolution.