

Physics 3704: Modern Physics

Course Outline

Description: (From the course catalog) “Special theory of relativity, quantum phenomena related to electromagnetic radiation and material particles. The Bohr model of the hydrogen atom; the Schroedinger equation; the Heisenberg uncertainty principle. Selected topics in atomic and nuclear physics.” This course is a General Education course in the Natural Sciences Domain and emphasizes General Education goals

(2) acquiring, processing, and presenting quantitative and qualitative information using the most appropriate technologies, including computers;

(3) reasoning critically, drawing sound conclusions, and applying those conclusions to one’s life and society.

(6) understanding the scientific method, forming and testing hypothesis as well as evaluating results;

(7) realizing the evolving relationships among science, technology, and society;

(13) understanding and appreciating the natural environment and the processes that shape it.

Prerequisites: (From the course catalog) PHYS 2611 (General Phys) and MATH 2673 (Cal III). You will be expected to do some algebra, calculus and just a bit of Differential Equations (whose general solution method we will introduce in a self-contained way in the class and through the book).

Textbook: P. A. Tipler and R. A. Llewellyn, “*Modern Physics*,” fifth ed. (W. H. Freeman and Co., NY. NY.) ISBN: 0-7167-7550-6

There are many books that we will be taking examples, graphs and even problems from. Some notes/photocopies will be made available as we advance through the material.

Attendance: Although attendance will not be recorded, there will be no makeups for exams, quizzes, and in class work that counts toward your grade, and so it is imperative that you are in class and ready to participate fully. The class will meet in room 2009 (Seminar Room) of Ward Beecher Hall 11-12, MWF.

Homework Weekly; turned in, graded and returned. I will also assign some problems that I want you to do BUT not hand in for grading. Past experience has shown that EXAM GRADES ARE VERY STRONGLY POSITIVELY CORRELATED WITH HOMEWORK GRADES, and since the homework grade constitutes 30% of your final grade, the homework grade has typically resulted in a final letter grade or two.

Reading Assignment It is imperative that you do your very best to keep up-to-date on the topic we are studying by reading the assigned sections of the book **before** the lecture. The reading assignments are meant to stimulate that activity. They are typically in the form of a few conceptual OR simple numerical examples that you do and turn in when you enter the class.

They are posted on the website for this class in the calendar (assignment list).

The Chapter ordering I anticipate (by week) is CH 1, 2, (3,4), 5, 6,(7+9.5) , 8, 10, 1/2 of 11, 12, 12 13.4-end. We do expect that there will be much overlap and reinforcement between this course and the laboratory in modern physics (this semester taught by Dr. W. Gregg Sturuss)

Chapter Quizzes: There will be chapter quizzes, typically a few days after we finish a chapter in lecture. It will be announced before hand and there will not be a quiz for every chapter. For example, typically a quiz that would ordinarily fall near a midterm date would be folded into the midterm material (and not given as a separate quiz). Each quiz will take about 30 minutes (typically

two questions), and will test conceptual and analytical mastery of the chapter material. Answer keys will be made available immediately to you after the exam either on paper or through the class web site. The quiz problems and the assigned homework are likely to overlap significantly. There will probably be fewer than 5 quizzes over the course of the semester.

There will be no make up quizzes. There will be no exceptions to this rule. You may miss one quiz before additional missed quizzes are counted in as zeroes.

Midterms: There will be three midterms; Each of these midterms will be a full class period long. They are all closed book, though you will be allowed one 8'-by-11' inch cheat sheet (both sides) that you will sign and hand in with you exam. The three midterm dates are

Friday, Sept. 23

Friday, Oct. 14

Friday, Nov. 18

There will be no make up exams. If you miss one for a valid excuse (which must be agreed upon with the professor *before* the exam) a score from that section of the final will count as the missed exam.

Final Exam: will be a comprehensive, in class exam and will take place on Monday, Dec 12, 10:30-12:30.

Grading policy: The grade will consist primarily of (midterms+final) and homework and other (reading quizzes, chapter quizzes, other) in an approximately 50-30-20 mix. Roughly, the final will count as two midterms (so 20 percent of the overall final course grade).

The grading scale will be

85+ A

75-85 B

60-75 C

50-60 D

50- F

Contact Information: Mike Crescimanno

PH: 330-941-7109, Fax: 330-941-3121

Office Hours: 12:00 AM - 2:00 PM MT, 12:00-1:00 PM WF but many(day-)times also by appointment!

Office: 2031 Ward Beecher Hall

e-mail: mcrescim@cc.ysu.edu

Course Web Site: <http://www.as.ysu.edu/~mcrescim/modern/>

What is on the web site? Everything... the homework and reading schedule to the answer keys to pre-lecture questions, to lecture notes/ mailing list/etc. I welcome suggestions for the web site and its use.

Incomplete Grading University Policy: An incomplete grade of "I" may be given to a student who has been doing satisfactory work in a course, but, for reasons beyond the control of the student and deemed justifiable by the instructor, has not completed all requirements for a course when grades were submitted. A letter grade MAY NOT be changed to an "I" (Incomplete) after the term has ended and grades have been recorded. For Fall Term courses, the final date to complete an "I" will be March 1 of the following term; for Spring Term course, July 11; for Summer Term courses, October 1. These dates can only be extended with the approval by the instructor and the Dean of the College where the course is taught. Forms for extension of the deadline may be obtained in the Physics & Astronomy office and after obtaining the proper signatures, this form must be to

the University Records office 24-hours before the original deadline (i.e. for Fall Term courses, March 1 of the following term).

Compliance with ADA In accordance with University procedure, if you have a documented disability and require accommodations to obtain equal access in this course; please contact me privately to discuss your specific needs. You must be registered with the Disability Services Office located at 275 Fifth Avenue and provide a letter of accommodations to verify your eligibility. You can reach the Disability Services Office at 330-941-1372.

Course Cancellation Policy: If this class is being cancelled for any one day due to instructor illness, or other reasons, an e-mail will be sent to the students YSU e-mail account as soon as possible, and a cancelled class notice will be put on the classroom door. University-Wide closure or University-Wide class cancellations is a decision made by through the Presidents Office, and officially announced via the YSU homepage and on WYSU (88.5 FM) radio. Students may also register at the YSU Portal to receive a text message about University-Wide closures via the Emergency Alert Notification System