

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 Schrodinger equation; the Heisenberg uncertainty principle. Selected topics in atomic and nuclear physics.”

Learning Outcomes: (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: *Concepts in Modern Physics*, A. Beiser, Sixth Edition, McGraw Hill Higher Ed.

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 2026 of Ward Beecher Hall 1-2, MTWF.

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.

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 be 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 (50 minutes) 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 midterm dates are

Friday, Sept. 19 (Emphasis on Ch. 1-3), and

Friday, Oct. 24 (Emphasizing chapters 4 through 8), and

Friday, Nov. 21 (Emphasizing chapters 10, 12-15).

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 Friday, 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

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e-mail: dcphn@gmail.com ... **please do not use my YSU e-mail as I find it very clunky and check it only about once a week.**

Office Hours: Mondays 9-10, Tuesday 2-4pm, Fridays 3-5pm, but any day also by appointment!

Blackboard and Web Site: We will make extensive use of blackboard for posting grades and items (HW, handouts) will also be available through blackboard and through the course website at <http://mjccrescimanno.people.ysu.edu/modern>.

University Policies:

University policies can be found online and provide you guidance on your rights as a student in this course. The links below take you directly to a specific policy. Should you have any questions about a policy, please do not hesitate to contact me using the information in this syllabus.

(Online at <https://ysu.edu/institute-teaching-and-learning/syllabus-university-policies>)

Statement of Non-Discrimination from the University

Academic Integrity/Honesty

Student Accessibility

Incomplete Grade Policy

YSU Class Attendance Policy

Religious Accommodation of Students