

Physics 410 -- Modern Physics
SUNY College at Cortland
Physics Department

Catalog Description: A study of modern theories of the atom and their experimental bases. Topics include the special theory of relativity, origins of quantum theory, the nuclear atom of Rutherford and Bohr, the electron as a fundamental particle, quantum aspects of radiation, the wave-particle duality, atomic spectra, and x-rays.

Prerequisite: PHY 202.

Required Text: *Modern Physics*, Paul A. Tipler and R. A. Llewellyn (Fifth Edition)

Course Information:

Fall 2008 Term, 3 credit hours

MWF 10:20-11:10 a.m.

Bowers 153

Professor Information:

Dr. Brice Smith

Bowers 143 (office)

Bowers 141 (lab)

brice.smith@cortland.edu

Office Hours: MWF 9:00-10:00am and 12:30-2:00pm

(Please make an appointment if you would like to see me at another time.)

Evaluation of Student Grades will be based on the total points accumulated from the following components:

3 One Hour Exams	70 points each
Final Exam	90 points
Outline and In-class Presentation	70 points
Homework	180 points

Maximum Points Possible: 550

Problem sets will typically be handed out on Wednesday and will be due the following Wednesday when an answer key will be provided. Late problem sets will not generally be accepted. A final curve will be established at the end of the course for the assignment of individual letter grades.

Presentation Skills Requirement:

Each student will prepare a 10 minute talk modeled on the platform presentations given at annual meetings of professional societies like the American Physical Society. In addition, each student will evaluate their own presentation and those of all other students at the time they are delivered. The final selection of topics will occur by October 24, 2008 at which time we will discuss the presentations and the requirements for the outlines during class. Outlines of the talks, including a list of no less than five sources, will be due by November 12, 2008. Students must meet with the instructor at least once prior to selecting their topic and once prior to submitting their outline. A resource packet including a copy of the self/peer evaluation form to be used when the presentations are given will be handed out on September 15, 2008 when we first discuss the presentations in class. This evaluation form will list all criteria against which the presentations will be judged. Each student will fill out an evaluation form for all talks including their own. Careful deliberation on these evaluations is expected and therefore the evaluations will tentatively be due the day following the presentations. Further requirements will be discussed in class.

Tests: Tests will be given on Sep. 24, Oct. 27, and Nov. 21

Students with a Disability:

If you are a student with a disability and wish to request accommodations, please contact the Office of Student Disability Services located in B-40 VanHoesen or call (607) 753-2066 for an appointment. Information regarding your disability will be treated in a confidential manner. Because many accommodations require early planning, requests for accommodations should be made as early as possible.

PHYSICS 410 - FALL 2008

<u>Date</u>	<u>Topic</u>	<u>Text</u>
Aug. 25, 27, 29	Introduction to Special Relativity	1-1 to 1-6 2-1 to 2-4
Sept. 1	<i>Labor Day - No Classes</i>	
Sept. 3, 5, 8, 10	Introduction to Special Relativity (cont.)	2-1 to 2-4
Sept. 12	Introduction to General Relativity	2-5
Sept. 15	Discussion and Overview of In-class Presentations	
Sept. 17, 19, 22	Quantization of Charge, Light, and Energy	3-1 to 3-4
Sept. 24	FIRST TEST	
Sept. 26, 29, Oct. 1	The Nuclear Atom	4-1 to 4-5
Oct. 3	<i>October Break - No Classes</i>	
Oct. 6, 8, 10	The Wavelike Properties of Particles	5-1 to 5-7
Oct. 13, 15, 17, 20, 22	The Schrödinger Equation	6-1 to 6-6
Oct. 24	Review and Selection of In-Class Presentation Topics	
Oct. 27	SECOND TEST	
Oct. 29, 31, Nov. 3, 5, 7	Statistical Physics	8-1 to 8-5
Nov. 10, 12, 14, 17, 19	Solid-State Physics	10-1 to 10-9
Nov. 21	THIRD TEST	
Nov. 24	Nuclear Physics	11-1 to 11-9
Nov. 26, 28	<i>Thanksgiving Break - No Classes</i>	
Dec. 1, 3, 5	In-class Presentations	