

General Physics III

Fall 2013

PHYS 283

Tuesday, Thursday, 2:00 – 3:15

Faraday West 200

Instructor:

Professor Laurence Lurio,

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Course description:

Physical laws governing optics, atomic, solid state, nuclear, and elementary particle physics using calculus.

Web site:

There are two websites for this class. General course information is available on blackboard web site <http://www.webcourses.niu.edu>. The class is also using an on-line homework system provided by Pearson education called “MasteringPhysics”. You can access this web page through <http://www.masteringphysics.com/>. In order to use the mastering physics page you need to either purchase an access code (\$66) or use the free access code that came with your textbook. You can also purchase the access code and an electronic copy of the textbook. If you purchased the book for a previous class such as 253 or 273 your code may still be valid. Once you have an access code you need to enroll in this class which is code number MPLURIOFL13.

Prerequisites:

Math 230 (Calculus II), and Phys 273 (General Physics II, Electricity and Magnetism)

Textbook:

Physics for Scientists and Engineers with Modern Physics, 4th edition, by Giancoli. We will be covering the third volume (Chapters 36 – 44) as well as two chapters from volume 2 (Chapters 34 and 35). If you do not already have volume 2 from PHYS 273, you can save money by just printing chapters 34 and 35 from the e-text available on the MasteringPhysics page.

Homework:

There will be weekly homework assignments assigned through “Mastering Physics”. Occasionally extra credit HW assignments will be given out in class. Students are also expected to read the chapter from the textbook indicated on the syllabus for each week.

Grading:

The approximate weighting of grades is given below.

Homework	25%
Exams (3):	45%
Comprehensive Final Exam:	30%

Exams and final exam:

The exam dates are given in the course calendar listed below. Only material covered up to the exam date will be included. Students should bring a calculator to all exams. (Cell phone calculators are not acceptable.) Students may also bring one page of handwritten notes (both sides). No other materials are allowed. Students who miss an exam with a valid excuse may take a make-up exam. Make-up exams will not be the same exam the rest of the class took.

Final exam:

The final exam is comprehensive. It will be held on Tuesday December 10, from 2-3:50 p.m. in the regular classroom.

Cheating:

Students found to have cheated on exams will receive a grade of F for that exam. All incidents or suspected incidents of cheating will be reported to the university judicial office.

Incomplete grades:

Incompletes will only be given under extraordinary circumstances, such as extended illness or call-up to active military duty.

Students with disabilities:

Academic accommodation will be provided as detailed on the Disability Resource Center web page: http://niu.edu/disability/accessibility_statement/index.shtml. In addition, students requesting accommodation are strongly encouraged to contact me early in the semester.

Calendar:

August	Tuesday		Thursday	
	27	Interference (ch. 34)	29	Interference
September	3	Interference	5	Diffraction (ch. 35)
	10	Diffraction	12	Relativity (ch. 36)
	17	Relativity	19	Relativity
	24	Exam 1	26	Early Quantum (ch. 37)
October	1	Early Quantum	3	Early Quantum
	8	Quantum (ch. 38)	10	Quantum
	15	Quantum	17	Atomic (ch. 39)
	22	Atomic	24	Solid state (ch. 40)
	29	Solid State	31	Solid state
November	5	Exam 2	7	Nuclear (ch. 41)
	12	Nuclear	14	Nuclear Energy (ch. 42)
	19	Nuclear Energy	21	Nuclear Energy
	26	Exam 3	28	Thanksgiving Break
December	3	Particle	5	Particle
	10	Final Exam 2:00-3:50		

How to Succeed in the Course

Your goals in this course are:

- 1) To understand the concepts which form the basis of modern physics; specifically relativity and quantum mechanics.
- 2) To understand the applications of these concepts to particles, nuclei, atoms, molecules and solids.
- 3) To obtain facility with numerical calculations of quantities related to modern physics.
- 4) To use critical thinking to solve non-trivial problems related to modern physics.

The lectures, textbook readings, and homework problems are all designed to help you achieve these goals. The primary function of the homework is not to evaluate your performance but to give you an opportunity to learn how to solve problems. The primary means of evaluating your performance will be the exams.

Learning goals 3 and 4 are different. Goal 3 should test how well you can apply the information you learned in class. Goal 4 should test critical thinking abilities such as the ability to think on your own and put different concepts together. Exam questions testing goal 4 will not be exactly the same problems we worked in class or on the homework. The point is to see if your understanding goes beyond just memorizing procedures you have already done.

The hardest part of this course is mastering goal 4. Here are a few hints:

- 1) Don't just read the book; understand what you are reading. This means reading a little and then stopping and thinking about what you just read. Underlining passages of text with a yellow marker while letting your mind wander doesn't count.
- 2) Read each chapter a second time, or third. You will be amazed at how much easier the chapter seems the second time you read it through.
- 3) Don't ask for help with the homework problems, but, rather, ask for help with the concepts you need to do the homework problems.
- 4) Give yourself enough time. You should expect to spend a minimum of 6 hours a week outside of class studying.
- 5) Have confidence in yourself. Some aspects of this course are difficult, but you will find the success is more rewarding when the task is difficult.
- 6) Have fun! I wouldn't be teaching this course if I didn't love modern physics. It's one of the greatest intellectual achievements of the modern age. There is a lot of really cool stuff here.