Physics 284 Modern Physics Laboratory

Spring 2009

Wednesday, 12:00 – 2:50, Faraday 121A

Instructor:
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Web Sites
http://www.niu.edu/~llurio/phys284/index.htm (NIU course page)
http://webcourses.niu.edu (Blackboard course page)
Class materials such as lab instructions will be placed on the NIU course page and also linked to the Blackboard course page. Grades will be posted to the Blackboard page.

Lab Instructions
Instructions for all the labs are available on the web and must be downloaded and read in advance of showing up for class. There will be a pre-lab assignment due before the lab begins, based on the lab instructions. Pre-labs will be collected at the beginning of class and will count for approximately 10% of the lab grade.

Grading
The laboratory grade will be based primarily on the lab reports. There will be 7 lab reports of 4-5 pages in length (including figures and data tables). The pre-lab assignment will count for 10% of the lab grade. General guidelines for how to complete lab reports and a breakdown of how lab reports will be graded are provided on the class web page. Each lab instruction sheet will also have some specific guidelines. **Lab reports are due one week after the completion of the lab.** Reports submitted late without the instructor's or TA's prior permission will be marked down 10%. The last possible date to submit late lab reports will be before 4:30 pm on Monday May 4th.

Lab Notebooks
All students are expected to keep a lab notebook. Since students will work in teams of two, they should either purchase a lab notebook with carbon paper, or make photocopies at the end of class, so that each student retains a copy of the notes. A copy of the relevant pages of the lab notebook should be attached to the back of each lab report. It is each students responsibility to make sure that they obtain a copy of all the notes from each lab.

Independent Project
The last laboratory will be an independent project of the students choosing. Students should discuss ideas for their independent lab with the instructor. The project will be graded based on only the lab notebook. Even if your independent project does not succeed, it is sufficient to demonstrate that you have made a careful effort, kept good notes, and proceeded in a scientific manner. While students are encouraged to come up with their own ideas, a short list of some suggested projects is included at the end of the syllabus. Students can work in groups of up to four on their independent project.

Calendar:

Date	**Topic**
Jan. 14	Computer Lab
21, 28, **Feb.** 4, 11, 18	Optics Lab
Feb. 25	Radiation Safety Training
Mar. 4, 18, 25 **Apr.** 1, 8, 15	Atomic and Nuclear Labs
Apr. 22, 29	Independent Project.

Optics Labs
Michaelson Interferometer
Diffraction Grating
Photoelectric Effect

Atomic and Nuclear Labs
Frank-Hertz Experiment
Electron charge to mass ratio
Radioactive Decay

Independent Project Lab Ideas

a) Comparison of the spectrum of a fluorescent light bulb with an incandescent light bulb using the spectrometer.
b) Electronic measurement of light intensity using a photodiode. Observation of the Meissner effect in a superconductor.
c) Automation of an experiment using the Labview software and an interface board.
d) Observation of magnetic domains.
e) Measurement of the spectrum of a star using the observatory.
f) Measurement of the flux of cosmic rays using the cosmic ray detector.
g) Measurment of the spectrum of beta particles using an energy resolving detector.
h) Observation of alpa-decay tracks in a cloud chamber.
i) Measurement of Compton scattering of x-rays.