

Course Information

PHYS 374 (4 credit hours)

Spring 2016. Faraday 121 and 238 1:00 – 2:50

Course website on blackboard

Instructor Information

Professor: Laurence Lurio (753-6470) (llurio@niu.edu)

Office location: La Tourette 202 (back of physics office)

Office Hours: Friday: 10:00 – 11:00.

Course Description: This is a one semester course in experimental methods of physics. Students will perform four experiments from areas of atomic, materials, nuclear and particle physics. Students will research the science behind each experiment, collect measurements, keep notes on their work, analyze their results, and write up and present their findings.

Intended Learning Outcomes: Students taking this course will learn how to apply the principles of physics towards making experimental measurements. They will learn how to independently research the background science for their experiments. They will obtain practice in making measurements in the laboratory, and will learn how to work with equipment in order to optimize their results. Students will also learn how to define their own research questions and how to reconfigure experimental tools so as to answer those questions. Students will learn basic techniques in data reduction and how to graphically display data. Students will learn how to apply statistical measures to data in order to produce the most accurate results and in order to estimate the confidence values and errors in their measurements. Students will acquire practice in presenting their work both as written reports and oral presentations.

Student Assessment:

Student grades will be based on attendance (5%), assessment activities and in-class exercises (5%) laboratory notes and preliminary data analysis (25%), oral presentations (25%) and written lab reports (40%). Students will work in two or three person teams on their experiments. Students in a group should maintain a single lab notebook, and an electronic copy of the lab notebook must be deposited through blackboard within one week of the completion of the lab.

Labs:

Students will complete four labs over the course of the semester. For each lab, the student is expected to perform independent reading on the subject of the lab, perform the experiment, present an oral summary of the results, and write a lab report. Students will change lab partners with each experiment. For the final lab, students will propose a two week independent project to extend the results of the lab. There will be no report for the independent project, but students will present a summary of their independent project results to the class.

Lab Reports:

Lab reports should be from five to ten pages long. A central part of the report will be the display of experimental results using figures and data tables. The text of the report must place these results in context and explain their significance. A first draft of the figures and data tables will be presented in class a week before the report is due, and the final report should take into consideration the feedback

from that presentation. Detailed guidelines for the lab reports and presentations are available on the blackboard page. Lab report will be written using the latex template supplied in class and an electronic pdf file must be submitted through SafeAssign on blackboard. A list of labs is available on the blackboard website.

Academic Integrity: Students are expected to hand in their own work for lab reports and oral presentations.

Students with disabilities:

If you need an accommodation for this class, please contact the Disability Resource Center as soon as possible. The DRC coordinates accommodations for students with disabilities. It is located on the 4th floor of the Health Services Building, and can be reached at 815-753-1303 (V) or drc@niu.edu.

Also, please contact me privately as soon as possible so we can discuss your accommodations. The sooner you let us know your needs, the sooner we can assist you in achieving your learning goals in this course.

Course Calendar:

			Grading and report writing techniques and pick partners for lab 1
19-Jan	Introduction to experimental uncertainty	21	
26	Begin Lab 1	28	
2-Feb		4	
9	Lab 1 theory presentation	11	Pick partners for lab 2
16	Lab 1 Results presentation and begin lab 2	18	Lab 1 report due
23		25	
1-Mar	Lab 2 theory presentation	3	Pick partners for lab 3
8	Lab 2 results presentation and begin lab 3	10	Lab 2 report due
Spring Break			
22		24	
29	Lab 3 theory presentation	31	pick partners for lab 4
5-Apr	Lab 3 results presentation and begin lab 4	7-Jan	
12		14	Begin Lab 4
19	Lab 4 theory presentation	21	
26	Lab 4 results presentation and begin lab 4 independent project	28	
2-May		5	
10-May	Lab 4 independent project results presentation		