Syllabus

Overview: Physics 413 is a one-semester hands-on experimental physics laboratory course for scientists and engineers. The course introduces instrumentation and techniques used in modern laboratories. Students will complete a series of experiments exploring topics in nuclear physics, atomic physics, optics / lasers and condensed matter physics along with some “classic” experiments of historical importance in physics. Data analysis techniques will also be covered. Clear and concise presentation of results through oral and written formats will be stressed.

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Web Site: Course information will be available on Blackboard at www.blackboard.odu.edu

Required: Bound Laboratory Notebook

Useful Resources: ---“Guide to LaTeX” by Helmut Kopka (a copy will be in the lab)
---“An Introduction to Error Analysis” by John Taylor
---“Statistics for Nuclear and Particle Physicists” by Louis Lyons
---“Techniques for Nuclear and Particle Physics Experiments” by William Leo

Lectures/Lab: Monday and Wednesday: 11:00 am – 12:50 pm. Rooms 224 and 246, OCNPS. You will also be expected to come to lab outside of scheduled hours to work on your laboratory exercises. Access to room 224 will provided via Prox Card (your student ID).

Exams: There are no regular exams.

Attendance: Attendance is mandatory. The work done in the laboratory must be the basis for the written lab reports. More than two unexcused absences will result in a failing grade. Each student must sign in at the beginning of class. The sign up sheet will only be available for the first few minutes of class.
Course Grade: Written Lab Reports 80%
Oral Presentation 10%
Laboratory Performance 10%

University Honor Code: You are expected to conform to the University Honor Code in all aspects of your conduct in this course. You are encouraged to work together in the laboratory and help each other to understand the material. However, your written lab reports, including data analysis must be entirely your own work. Any cases of suspected academic dishonesty will be processed according to the policy in the undergraduate catalog.

Experiments: You and your lab partner will perform six experiments over the course of the semester. Two weeks of class time is allotted for each experiment, but it is likely that you will have to spend additional time outside of class in room 224 or 246 to complete your experiments. Both partners must be present for all laboratory work. Make sure you choose a lab partner who has time available at the same time you do for work outside of the scheduled class meeting times. You will have some choice as to which experiments you perform.

Lab Notebook: You are required to have a bound laboratory notebook for all lab activities. Your lab notebook should be a neat (readable) record of everything you do in class. Each page must be dated. Your instructors will check to see that you have the notebook with you in class and that you are using it to record your notes and observations. It is not OK to take notes on various loose pages!

Lab Reports: A lab report must be submitted for each of the six experiments. You will be given detailed guidance on the expected format for laboratory reports. Your lab reports are expected to be of high quality and neatly formatted, including correct grammar, syntax, and spelling. All tables and figures should be labeled clearly and include captions. The write up should contain the title of the experiment, name of the author and name(s) of lab partners, an abstract, an introduction including theory and/or experimental motivation, description of the experiment you performed, analysis of data (including error analysis) and results, conclusion, acknowledgements (if appropriate), and references. Each student must submit his/her own report. This is a writing intensive course; adequate time must be allocated to analyzing the data and writing the report. Points will be deducted for late lab reports. You are expected to prepare your report using LaTeX, which is widely available for free on the web.

Oral Presentations: For one of your experiments, you will present your experiment orally to the class at the end of the semester. Your presentation must clearly and concisely cover the motivation for the experiment, the equipment/technique you used, and your results. The instructor and fellow students may question you about any aspect of the experiment.

Accommodation: Students are encouraged to self-disclose disabilities that have been verified by the Office of Educational Accessibility by providing Accommodation Letters to their instructors early in the semester in order to start receiving accommodations. Accommodations will not be made until the Accommodation Letters are provided to instructors each semester.
Physics 413 Rules:

- Attend each lab. Be on time.
- No food or drink permitted in the classroom.
- No cell phone use in the classroom, except for course work related activities (calculator, accessing blackboard)
- Work in groups of two. The only time there should be three people in a group is if there are an odd number of people enrolled in the class.
- Both partners must participate fully in all lab activities. The instructor will reassign lab groups as needed.
- When you finish an experiment, clean up the station and return everything to the same state in which you found it (or better).