

Physics 235

Modern Physics Laboratory

Description: 4 hrs., 2 cr. Pre-req PHYS120 or 121. Selected experiments of quantum physics and optics. Experiments include nuclear half-life, Michelson interferometer, Bragg scattering of x-rays, nuclear scintillation-multichannel analyzer, Franck-Hertz quantum levels, Millikan oil drop, photoelectric effect (Einstein). Error analysis techniques including the Binomial, Gauss and Poisson distributions and correlation of data. Students will also learn to use aspects of Mathematica software for graphing and data analysis.

Instructor: Prof. Varley, Room 1216 North, Telephone 772-5252.

Hours by appointment.

Text: "An Introduction to Error Analysis" by John R. Taylor

Recommended Text: Aspects of Mathematica will be discussed in the lecture part of the class and zerox handouts will be provided to the students. However, the student may wish to learn more about Mathematica and for this purpose "The Beginner's Guide to Mathematica" by Gray and Glynn is recommended.

1. The student is expected to write a report for each of the six experiments performed for this laboratory class. The lab reports will be graded. It is strongly recommended the student resubmit the lab report with the errors corrected and suggested changes completed. The grade on the second submission of the lab report will be counted toward the final mark in the course.
2. Various homework assignments involving error analysis will also be made. Several short quizzes on error analysis will be given during the semester. The student will have a week to prepare for the quiz.
3. Attendance is required for this course unless arrangement is made with the instructor.

Grading Scheme:

1. 80% lab reports
2. 10% average of quiz grades
3. 10% attendance

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