UNIVERSITY of HOUSTON

COLLEGE OF NATURAL SCIENCES & MATHEMATICS **HTTP://NSM.UH.EDU**

COURSE TITLE/SECTION: Phys 3110, Seminar in Advanced Laboratory Analysis / 18172
Spring 2018

TIME: T 1 - 2:30 pm **LOCATION: SR1 606**

FACULTY: Dr. Rebecca Forrest **OFFICE HOURS: SR1 515C, M-Th 11 am – noon, & by appointment**

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I. Course

Cr. 1. (1-0). Prerequisites: PHYS 1122 and 1322. A lecture course to accompany the advanced physics laboratory. Lectures in systemic and random error analysis, basic mechanical and electrical measurement techniques, elementary circuit analysis, graphical and computer analysis of data and general principles of experimental and laboratory technique. May not be repeated for credit.

II. Course Objectives: Upon completion of this course, students will:

1. Know how to format a technical paper
2. Know how to keep a laboratory notebook
3. Be familiar with common laboratory equipment
4. Understand the basics of error analysis
5. Gain experience with written and oral presentation

III. Course Content: The 3110 course will include the following topical areas:

1. Writing Lab Reports
2. Keeping a Lab Notebook
3. Scientific Ethics
4. Least Squares Fitting
5. Giving Scientific Presentations
6. Understanding Scientific Equipment, including
    a. Oscilloscopes
    b. Lasers
    c. Vacuum pumps, pressure and temperature measurement
    d. Analog to digital converters
    e. Lock-in amplifiers
    f. Multichannel analyzers
    g. Computer assisted data collection

V. Textbook: Experiments in Modern Physics, A.C. Melissinos, Academic Press 2003

Additional Reading: The Art of Experimental Physics, D.W. Preston, E.R. Dietz, John Wiley & Sons 1991; Practical Physics, G.L. Squires, Cambridge University Press 2001; Introduction to Error Analysis, J.R. Taylor, University Science Books 1996.

VI. Course Requirements

A. Reading Assignments: Read the appropriate section from the text or handout before class. This will prepare you to ask questions during the presentation.

B. Written Assignments: Homework: After each instructor presentation there will be a homework assignment, due the following class day. The assignment for each student presentation is to fill out an evaluation of the presentation, using the rubric provided (homework score of 10 per class). The average of the student evaluations will count as ½ of the presenter's score (see below).

C. Oral Presentation: In the second part of the semester each student will present a seminar talk using Power

Point or a similar program. Talks should be about 15 minutes long. Most talks will cover a common piece of equipment found in physics laboratories, topics will be assigned on the first class day. Each talk should explain 1) What it is, 2) A brief historical background, 3) What it's used for, 4) How it works, and 5) How you operate it (if appropriate). Presentation grades will be based on the content and format of the points above, and on the presenter's delivery. Grading criteria can be found on Dr. Forrest's web page. The presentation grade will be determined by the instructor's evaluation (50%) and the average student evaluation (50%). The presenter must turn in a pdf of the presentation on Blackboard Learn before the presentation, and a one-page study guide for the exam explaining 1) What it is, 2) A brief historical background, 3) What it's used for, 4) How it works, and 5) How you operate it (if appropriate). Each point should be answered briefly, in 1-3 sentences. The presenter is expected to answer questions asked by the class.

D. Exam: There will be a final exam covering the student presentation topics. There will be one multiple-choice question from each presentation, over the material in the study guides. The (corrected) study guides will be posted on Blackboard Learn before the final exam.

VII. Evaluation and Grading

34%	Presentation
34%	Homework
32%	Final Exam (12/5/17, in class)
100%	

Attendance to seminar is required. After three unexcused absences the student will receive an F in Phys 3110. (Excused absences due to illness, etc., will not be counted against the student, if approved by the instructor.)

VIII. Additional Notes

Policy on grades of I (Incomplete): The grade of "I" (Incomplete) is a conditional and temporary grade given when a student, for reasons beyond his or her control, has not completed a relatively small portion of all requirements. Sufficiently serious, documented situations include illness, death in the family, etc.

Addendum: Whenever possible, and in accordance with 504/ADA guidelines, the University of Houston will attempt to provide reasonable academic accommodations to students who request and require them. Please call 713-743-5400 for more assistance.

Academic Honesty: It is each student's responsibility to read and understand the Academic Honesty Policy found at http://catalog.uh.edu/content.php?catoid=6&navoid=1025.

Religious Holy Days: Students whose religious beliefs prohibit class attendance or the completion of specific assignments on designated dates may obtain an excused absence. To do so, please make a written request for an excused absence and submit it to your instructor as soon as possible, to allow the instructor to make arrangements. For more information, see the Student Handbook.
http://catalog.uh.edu/content.php?catoid=4&navoid=791.

Counseling and Psychological Services (CAPS) can help students who are having difficulties managing stress, adjusting to college, or feeling sad and hopeless. You can reach CAPS (www.uh.edu/caps) by calling 713-743-5454 during and after business hours for routine appointments or if you or someone you know is in crisis. Also, there is no appointment necessary for the "Let's Talk" program, which is a drop-in consultation service at convenient locations and hours around campus. http://www.uh.edu/caps/outreach/lets_talk.html.

Standard Disclaimer: This syllabus is subject to change at the discretion of the instructor.