Syllabus and Course Information for Physics 258, Fall 2004

STAFF

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TEXTBOOKS

(1) Philip R. Bevington and D. Keith Robinson, *Data Reduction and Error Analysis for the Physical Sciences (3rd Edition)*, McGraw-Hill, 2003. ISBN 0-07-247227-8. See also the website, http://www.mhhe.com/bevington

(2) John R. Taylor, *An Introduction to Error Analysis: The Study of Uncertainties in Physical Measurements, 2nd Edition,* University Science Books, 1997. ISBN 0-935702-75-X.

(3) Robert A. Day, *Scientific English: A Guide for Scientists and other Professionals,* Oryx, 1995. ISBN 0-89774-989-8.

Bevington's book, very recently updated in a new edition, is more advanced and much more useful as a permanent reference. Taylor is a better introductory textbook if you are a little uncomfortable with partial derivatives.

SYLLABUS

Physics 258 consists of lectures and experiments, augmented by exercises in numerical methods and computer-assisted data acquisition, primarily using Mathcad and Labview respectively, No prior familiarity with these languages is assumed, although some experience is helpful. Physics 258, will involve nine or ten experiments and projects, drawn from the following tentative list: Large-amplitude pendulum, Catenary, Coupled oscillators, Cavendish experiment, Kater's pendulum, Fourier transforms, Radioactive decay, Poisson processes, Thermometry, Damped driven harmonic oscillator, and Speed of light. The lectures will cover a variety of topics related to experimental physics, including not only the physics of the experiments, but also probability and statistics (especially as related to analysis of uncertainties), scientific writing, and numerical methods.

ASSIGNMENTS AND GRADING

The 'Z' designation indicates that the course fulfills 'Q,' 'W,' and 'C' requirements. The grading reflects this mult-purpose designation. The weighting will be:

Lab reports: 40%
Weekly abstracts   10%
Final paper   30%
Oral presentation   10%
Lab skills   10%

Be sure to read the lab write-ups in advance of coming to lab. Written abstracts and lab reports are due the week after the lab exercise is completed. Grades for late assignments will be deducted one letter grade for each week the work is overdue. The final report will be evaluated both for the quality of the science and the quality of your scientific writing. A first draft of the final report is due in class on Tuesday November 16, 2004. This draft will be corrected and returned to you at the next class meeting so that you can make appropriate revisions. Take care with the draft, as a poorly written first draft usually leads to a poor final result. The final report is due on the last day of regular classes. *In all academic exercises, examinations, papers, and reports, students shall submit their own work. Footnotes or some other acceptable form of citation must accompany any use of another's words or ideas. See the Dean of Students website for the complete student code.*