Physics 2305

Computation for the Physical Sciences

Course Outline---Fall Semester 2012

Instructor: Thomas L. Gibson **Office:** Sc 27 **Phone:**742-1606
Office Hours: 10:00-11:00 a.m. T,Th or 1:30-3:00 p.m. M,W (or by appointment)
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url: www.phys.ttu.edu/~ritlg/courses/p2305/

Recommended Texts: *Linux in Easy Steps*, 4th Edition, by Mike McGrath (In Easy Steps Limited, 2008) ISBN-13: 9781840783513, *Gnuplot in Action: Understanding Data with Graphs*, by Philipp K. Janert (Manning Publications, 2009) ISBN-13: 978-1933988399.

Required Texts: *Digital Media Ethics (Digital Media and Society)*, by Charles Ess (Polity Press, 2009) ISBN-13:978-0-7456-4164-5, *Engineering Problem Solving with C++*, by D.M. Etter and J.A. Ingber (Pearson Prentice Hall, 2008) ISBN-13:978-0-13-601175-0.

The objective of the course is to enable the student to understand how profoundly scientific, technological, and computational developments affect society and the environment.

Course Purpose

Students graduating from Texas Tech University should be able to demonstrate understanding of how technology and applied science affects society and the environment and to demonstrate understanding of the relationship of ethics and technology.

Expected Learning Outcomes

Learning Outcome	Assessment
Describe examples of ethical implications associated with use of technology and applied science.	Abstract and original in class presentation.
Understand the limitations of finite representation.	Pre-instruction and Post-instruction exams.
Develop facility with the production and display of quantitative information.	In class presentation and critique of student projects.

Course Coverage

1. Rights, Ethics, and Responsibilites in the Digital Environment
2. Introduction to Linux
    a. Commands, Files, and Directories
    b. Finding Help
    c. Editors
    d. Internet Browser

    e. Online Library
3. Introduction to C++
    a. Precision and Arithmetic Computations
    b. Manipulation and Importation of Data Files
    c. Introduction to Simple Two-Dimensional Plotting
        i. Using gnuplot and xmgrace
    d. Introduction to Modeling Physical Systems
        i. Realistic Projectile Motion
        ii. Oscillatory Motion and Chaos
        iii. Potentials and Fields
        iv. Energy Levels of the Finite Square Well
        v. Curve Fitting and Data Analysis
        vi. Random Systems

Important Notes

e. Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructorÂ¹s office hours. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services office in 335 West Hall or 806-742-2405.
f. The faculty is strongly committed to upholding standards of academic integrity. These standards, at the minimum, require that students never present the work of others as their own. Further, rude, disruptive, or disrespectful behavior has no place in the classroom and will not be tolerated.

Grading Policy

Post deadline work will not be accepted.
No one should expect a high grade based on simply doing the minimum for each assignment; correct, but perfunctory work is, at best, average, i.e., a C.

Credit Breakdown		**Grading Scale**	
Abstract and In-Class Presentation:	20%	92-100	A
Assigned Projects:	60%	82-91	B
Comprehensive Final Exam:	20%	66-81	C
(1:30-4:00 p.m. 12/10/2012)		55-65	D

I do use +/- grades one point either side of a grade boundary, e.g., grades of 90 or 91 earn a B^+ while grades of 92 or 93 earn an A^-.

Strategy for Success

g. Be prepared! Study your notes and read the texts as well as other, appropriate materials before you come to class.
h. Begin all homework assignments as soon as possible. The assignments take time and thought---never wait until the night before an assignment is due.
i. Do your own work; doing is indispensable to learning. Although you are free to *discuss* the homework or problems that you might be having with other members of the class, do not rely on others to figure out all of your problems!
j. See your instructor if you are stuck---that's why they pay him the big bucks!

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