SYLLABUS and REQUIREMENTS

PHYS5416 *Applied Numerical Methods*, Fall 2009

Prof. Xinchou Lou

Object of the Course

To learn and apply computational techniques to analyze data and to solve scientific problems numerically in most computing environments by using the ROOT program, or other programming and visualization tools.

Physics 5416 Course Policy

(1) Class attendance is required for this course.
(2) The programming language for weekly labs/projects is C++. Familiarity with C++ is very useful, but not required if you are willing to learn the basics of C++.
(3) Each of the weekly computing projects is due in one week. No late project is accepted.

Reference Books (Not required. Available in my office for browsing)

Numerical Methods for Physics, A. L. Garcia, ISBN 0-13-906744-2, Prentice Hall, Inc.
Numerical Methods for Scientists and Engineers, R.W. Hamming
Statistics for Nuclear and Particle Physicists, by Louis Lyons,
Cambridge University Press, ISBN 0 521 37934 2
Numerical Recipes in C, William H. Press *et al*., Cambridge Univ. Press
(available online at http://www.nrbook.com/a/bookcpdf.php)
A Course in Probability and Statistics, Charles J. Stone

Course Content and Schedule

PHYS5416 is a one-semester course. The contents include probability and statistics, error analysis, numerical analysis of data, optimizations, solving systems of equations, algorithms, applications of numerical methods in physical sciences, and a final chapter on the neural network which will be followed by a set of NN examples. Class web site is at http://www.utdallas.edu/~xinchou/phys5416-Fall2009.htm.

Weekly Computing Projects

No homework assignments are made. Students will have opportunities to work out homework style problems in class (not graded). Together students and the instructor will eventually go over these problems as exercises/examples in class. Weekly projects are assigned and are due in one week. These projects can be run on your own computers. Full instruction on these projects will be detailed in the project assignment at the class web site. Project reports (in the form of printed hardcopy) must be submitted to the instructor in person or placed inside the instructor's mail box in ECSN2.230. No late reports are permitted.

Grades

The grade of the course will be based entirely on weekly computing projects (100%).

Office Hours *(preliminary--subject to change)*

Monday, Wednesday 8:45 -- 9:30 pm other time by appointment only.
Prof. X. C. Lou ECSN2.518 xinchou@utdallas.edu Messages 972-883-6409.