PHYS5305 SYLLABUS

Dr.s Jianlong Hu and Xinchou Lou

Physics 5305-501 Objective

A tool course to provide a forum to graduate students to master advanced Monte Carlo simulation and analysis skills essential for conducting physical sciences research and other technical simulation and analysis.

Physics 5305 General

(1) The official reference book for the course is
Simulation and the Monte Carlo Method by Reuven Y. Rubinstein
(expensive at $151/book, 1 at UTD library, I have my own. Ask me to view it.)

(2) The following books are used as additional reference books: (available at library)
Computer Simulation and Computer Algebra by D. Stauffer *et. al.*
Monte Carlo Methods (Vol 1) by M. H. Kalos and P. A. Whitlock
Statistics for Nuclear and Particle Physicists by Louis Lyons
Periodically, selected lecture notes will be distributed to the class.

(2) This is a tool course, so there won't be any tests. Active classroom discussion is strongly encouraged. A student is expected to understand the lecture content right in the classroom, and is not expected to have extensive after-class readings.

(3) Several homework sets will be assigned. Discussions on concepts among students are encouraged. Independent work from each student is expected.

(4) Two class projects (midterm and final) are required and will be assigned several weeks before the deadlines. Guidelines and requirements for the projects will be stated in the project assignments.

(5) Access to a computer, or a UTD Unix account, is required for each student.

Course Schedule

Review of Probability and Statistics
Advanced Topics in Probability and Statistics
Tutorial of the ROOT Program for Simulation and Data Analysis
Random Number Generations and Test of Their Randomness
Modeling of Scientific and Engineering Projects
Working Sessions on Midterm Project, Report of Student Project
Monte Carlo Simulation and Its Applications
Monte Carlo Optimization
Monte Carlo vs Other Methods (NN Methods for Pattern Recognition)
Working Sessions on Final Project, Report of Student Project

Course Web Site: http://www.utdallas.edu/~xinchou/phys5305-Fall2006.htm

Grades

The grade of the course will be based on the homework (20%), and the projects (80%).

Office Hour (*subject to change*)

8:15-8:45 pm Tuesday and Thursday, CB1.122.

4:15 – 5:15 pm Monday/Wednesday, other time by appointment only.
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