King Fahd University of Petroleum & Minerals
Chemical Engineering Department
CHE 560 Numerical Methods in Chemical Engineering (3-0-3)
2007 - 2008 (072)

Course Instructor:
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Office Hours: SUMTW 1:00 to 2:00 P.M.

Bulletin Description: Normalization of models, visualization of profiles, analysis of models of chemical processes, non-linear finite difference techniques, orthogonal collocation, non-linear algebraic equations, initial value and boundary value problems in chemical engineering, software packages for solving such problems.

Textbooks: R. C. Rice, and D. D. Do, Applied Mathematics and Modeling for Chemical Engineers, Wiley and Sons, New York, 1995.

Reference book : A. Constantinides and N. Mostoufi, Numerical Methods for Chemical Engineers With MATLAB Application, Printice Hall International, 1999.

Objective: To apply numerical methods to the solution of chemical engineering problems.

Pre-requisite: Graduate Standing.

Evaluation Methods:
Homework's 20%
Midterm Examination 25%
Term Project 25%
Final Examination 30%

Topics:
Introduction to Mathematical Modeling. (1 week)
Review of Basic Matrix Operations. (1 week)
Numerical Solution of Linear Algebraic Equations. (1 week)
Numerical Solution of Nonlinear Algebraic Equations. (2 weeks)
Numerical Solution of ODE's (Initial Value Problems). (2 weeks)
Numerical Solution of ODE's (Boundary Value Problems). (3 weeks)
Numerical solution of PDE's. (5 weeks)