King Fahd University of Petroleum and Minerals
Department of Mathematics & Statistics

Math 572 – Syllabus

2012-2013, Semester I
Instructor: Kassem Mustapha

Title: Numerical Analysis of Partial Differential Equations
Textbook: Partial Differential Equations with Numerical Methods by Larsson &Thomee

Description: Theory and implementation of numerical methods for boundary value problems in partial differential equations (elliptic, parabolic, and hyperbolic). Finite difference and finite element methods and projection methods: convergence, stability, error estimates and computations.

Main Topics:

1- Two-Point Boundary Value Problem
2- Finite Difference Methods for Two-Point Boundary Value Problems
3- Finite Element Methods for Two-Point Boundary Value Problems
4- Numerical Integration
5- Elliptic Problem
6- Finite Difference Methods for Elliptic Problems
7- Finite Element Methods for Elliptic Problems
8- Parabolic Problem
9- Finite Difference Methods for Parabolic Problems
10- Finite Element Methods for Parabolic Problems
11- Hyperbolic Problem
12- Finite Difference Methods for Hyperbolic Problems
13- Finite Element Methods for Hyperbolic Problems

Grading Policy:

1. Assignments: 20 %
2. Home Work: 20 %
3. Midterm Exam: 25 %
4. Final Exam: 35 %

Office hours: S-M-W, from 10:00 AM to 11:00 AM,
Office: Building 5, Room 203-5