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

Math 572 – Syllabus

2015-2016, Semester II
Instructor: Kassem Mustapha

Title: Numerical Analysis of Partial Differential Equations
Textbook: Partial Differential Equations with Numerical Methods by Stig Larsson &Vidar 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. 6 Assignments: 36 %
2. Midterm Exam: 24 %
3. Final Exam: 40 %

Office hours: Sunday-Monday-Thursday, from 1:00 PM to 2:00 PM,
Office: Building 5, Room 203-5