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

Math 572 – Syllabus

2018-2019, Semester I
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- Some PDEs from physics and classifications
2- Finite Difference Methods for Two-Point Boundary Value Problems
3- Finite Element Methods for Two-Point Boundary Value Problems
4- Numerical Integration
5- Finite Difference Methods for Elliptic Problems
6- Finite Element Methods for Elliptic Problems
7- Finite Difference Methods for Parabolic Problems
8- Finite Element Methods for Parabolic Problems
9- Numerical solutions for Wave Equations
10- Discontinuous Galerkin methods

Grading Policy:

1. 5 Assignments: 30 %
2. Midterm Exam: 30 %
3. Final Exam: 40 %

Office hours: Tuesday, from 9:00 AM till 12:00 noon
Office: Building 5, Room 203-5