

**King Fahd University of Petroleum and Minerals**  
**Department of Mathematics & Statistics**  
**Math 673 – Syllabus**  
**2017-2018, Semester I**  
**Instructor: Kassem Mustapha**

**Title:** Numerical Solution of Integral Equations

**Textbook:** The Numerical Solution of Integral Equations of the Second Kind, Kendall E. Atkinson, 1997

**Description:** Numerical methods and approximate solutions of Fredholm integral equations of the second kind. Nystrom method. Method of degenerate kernels. Collectively compact operator approximations. Numerical methods for Volterra integral equations. Methods of collocation, Galerkin, moments, and spline approximations for integral equations. Iterative methods.

**Topics in order:**

- 1- Types of integral equations
- 2- Compact integral operators
- 3- The Fredholm alternative theorem
- 4- Degenerate kernel methods
- 5- Projection methods (including Collocation and Galerkin)
- 6- Nystrom method
- 7- Iteration methods
- 8- Discontinuous Galerkin methods for VIDEs

**Grading Policy:**

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