# MATH 362A - FALL 2010

**Instructor**: Professor Jesse Peterson
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**Office**: SC 1414
**Office Hours**:
Mondays 3:10 - 4:00
Wednesdays 11:10 - 12:00
Wednesday 3:10 - 4:00

**Prerequisites**: A first year graduate course in Real Analysis.

**Books**:
Functional Analysis by Kôsaku Yosida, reprint of the 1980 sixth edition.
ISBN: 3-540-58654-7

A course in Functional Analysis by John B. Conway, second edition.
ISBN: 1-441-93092-2

**Website**:
There is a website for the course which is accessible from www.math.vanderbilt.edu/~peters10/

**Description**:
This will be an introductory course on functional analysis. Functional analysis is concerned with the study of vector spaces which have a natural topology, and linear operators between such spaces which interact nicely with the topologies. Topics covered will include: Function spaces, topological vector spaces, linear operators, conjugate spaces, Hilbert and Banach spaces, Banach algebras. Applications to function theory, differential equations, and integral equations.

Some highlights of the course will be the Hahn-Banach Theorem, the Closed Graph Theorem, the Open Mapping Theorem, the Uniform Boundedness Principle, weak topologies, Alaoglu's Theorem, compact operators, normal operators, a spectral theorem, and a functional calculus. How much we cover will depend on the pace of the class.

**Grades**:
Grades will be based on homework, and class attendance/participation. There will be no exams.