Department: Mathematics and Computer Sciences
Division: Pure Mathematics
Level and Major: Graduate

Course Title: Functional Analysis
Number of Credits: 3
Prerequisite:
Lecturer:

Course Description:

Course Goals and Objectives:

Course Topics:

- Hilbert Spaces, Orthogonality, The Riesz Representation Theorem, Orthonormal Sets, Isomorphic Hilbert Spaces, The Direct Sum of Hilbert Spaces
- Elementary Properties and Examples, The Adjoint of an Operator, Projections and Idempotents, Compact Operators
- Elementary Properties and Examples, Linear Operators on Normed Spaces, Finite Dimensional Normed Spaces
- Quotients and Products of Normed Spaces, Linear Functionals, The Hahn-Banach Theorem
- The Dual of a Quotient Space and a Subspace, Reflexive Spaces, The Open Mapping and Closed Graph Theorems, Complemented Subspaces of a Banach Space, The Principle of Uniform Boundedness
- Locally convex spaces, Metrizable and Normable Locally Convex Spaces, Some Geometric Consequences of the Hahn-Banach Theorem
- The Dual of a Subspace and a Quotient Space, Alaoglus Theorem, Separability and Metrizability, Weak and weak* topologies, Weak compactness
- The Adjoint of a Linear Operator, Compact Operators on Banach spaces, Weakly compact operators

Reading Resources:

Evaluation: