REAL ANALYSIS II. MATH 8144

Text: Real analysis (4th edition) Prentice Hall, H.L. Royden and P.M. Fitzpatrick

The L^p spaces

- Normed linear spaces (7.1)
- The Inequalities of Young, Hölder and Minkowski (7.2)
- Lp is complete: The Riesz-Fischer Theorem (7.3)
- Approximation and separability (7.4)
- The Riesz representation for the dual of Lp (8.1)
- Weak sequential convergence in Lp (8.2)
- Weak sequential compactness (8.3)

Metric spaces

- Examples of metric spaces (9.1)
- Open and closed sets. Convergent sequences (9.2)
- Continuous mappings between metric spaces (9.3)
- Complete metric spaces (9.4)
- Compact metric spaces (9.5)
- Separable metric spaces (9.6)
- The Arzela-Ascoli Theorem (10.1)
- The Baire Category Theorem (10.2)

Continuous linear operators between Banach spaces

- Normed linear paces (13.1)
- Linear operators (13.2)
- Compactness lost: infinite dimensional normed liner spaces (13.3)
- Open Mapping and Closed Graph theorems (13.4)
- Uniform Boundedness Principle (13.5)

Duality for normed linear spaces

- Bounded linear functionals and weak topologies (14.1)
- Hahn-Banach Theorem (14.2)
- Reflexive Banach spaces and weak sequential convergence (14.3)

Continuous linear operators on Hilbert spaces

- The inner product and orthogonality (16.1)
- The dual space and weak sequential convergence (16.2)
- Bessel's inequality and orthonormal bases (16.3)
- Adjoints and symmetry for linear operators (16.4)
- Compact operators (16.5)