Code	Subject Title		Cr. Hrs	Semester
MATH-311	Functional Analysis-I		3	VI
Year	Discipline			
3	Mathematics-I,II			

Metric Space
- Review of metric spaces
- Convergence in metric spaces
- Complete metric spaces
- Completeness proofs
- Dense sets and separable spaces
- No-where dense sets
- Baire category theorem

Normed Spaces
- Normed linear spaces
- Banach spaces
- Convex sets
- Quotient spaces
- Equivalent norms
- Linear operators
- Linear functionals
- Finite dimensional normed spaces
- Continuous or bounded linear operators
- Dual spaces

Inner Product Spaces
- Definition and examples
- Orthonormal sets and bases
- Annihilators, projections
- Hilbert space
- Linear functionals on Hilbert spaces
- Reflexivity of Hilbert spaces

Recommended Books
1. E. Kreyszig, *Introduction to Functional Analysis with Applications*, (John Wiley and Sons, 2004)
2. A. L. Brown and A. Page, *Elements of Functional Analysis*, (Van Nostrand Reinhold London, 1970)
3. G. Bachman and L. Narici, *Functional Analysis*, (Academic Press, New York, 1966)
4. F. Riesz and B. Sz. Nagay, *Functional Analysis*, (Dover Publications, Inc., New York, Ungar, 1965)
5. A. E. Taylor, *Functional Analysis*, (John Wiley and Sons, Toppan, 1958)