M.A/M.Sc Mathematics Semester 3rd

Effective from academic session 2011 ⟹ **Repetition for 2012 with minor change**

FUNCTIONAL ANALYSIS-II

Course No. MM-CP-302

Unit I

Relationship between analytic and geometric forms of Hahn-Banach Theorem, Applications of Hahn-Banach Theorem: Banach limits, Markov-Kakutani theorem for a commuting family of maps, Complemented subspaces of Banach spaces, Complentability of dual of a Banach space in its bidual, uncomplementability of co, Dual of Subspace, Quotient space of a normed space.

Unit II

Banach's closed range theorem, injective and surjective bounded linear mappings between Banach spaces ℓ_∞ and C[0,1] as universal separable Banach spaces, l_1 as a quotient universal separable Banach space, Weak and weak* topologies on a Banach space, Goldstine's theorem, Banach-Alaoglu theorem and its simple consequences.

Unit III

Reflexivity of Banach spaces and weak compactness, Completeness of Lp[a,b]. Duals of ℓ_∞, C(X) and Lp spaces, Banach Stone Theorem, Applications of fundamental theorems to Radon-Nikodym Theorem, Laplace transform.

Unit IV

Extreme points, Krein-Milman theorem and its simple consequences, Mazur-Ulam theorem on isometries between real normed spaces, Muntz theorem for L_2[a,b]. Bases in Banach spaces, Schauder basis for C[0,1].

Recommended Books:

1. Ballobas, B;Lineart Analysis(Camb. Univ.Pres)
2. Goffman, C and Pedrick ,G; A first course in functional Analysis (Prentice Hall.)
3. Beauzamy, B; Indroduction to Banach Spaces and their geometry (North Holland).
4. Rudin, W; Functional Analysis (Tata McGrawHill).