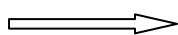


M.A/M.Sc Mathematics Semester 4th

Effective from academic session 2011



Repetition for 2012 with minor change

ADVANCED TOPICS IN FUNCTIONAL ANALYSIS

Course No. MM-OP-403

Unit I

Topological vector spaces (TVS), Definition and Examples. Basic properties –subspaces quotients and products of TVS, Bounded sets & totally bounded sets. characterizing a linear topology in terms of a local' base. Continuous and bounded linear maps between TVS.

Unit II

Projective and inductive topologies, Projective and inductive limits of linear topologies. Weak topology of a TVS, Metrization in TVS. Completeness, sequential completeness and quasi completeness in TVS and their relationship. F-spaces and open mapping theorem/closed-graph theorem in F-spaces.

Unit III

Locally convex spaces & their characterizations. Hahn-Banach theorem & its simple consequences. Duality & polar topologies. Compatible linear (locally convex) topologies, Mackey-Arens Theorem.

Unit IV

Duality invariance of bounded & closed convex sets. Equicontinuity and Alaoglu-Bourbaki theorem. Bipolar theorem. Barrelled infrabarrelled and bornological spaces. Banach-Steinhaus theorem.

Recommended Books

- 1 Wilansky, A: Modern Methods in Topological Vector Spaces(McGraw Hill).
- 2 Swartz, C: Topological Vector Spaces (Marcel Dekker).

Suggested Readings:

1. Rudin, W: Functional Analysis (Tata McGrawHill).
2. Jarchow ,H,: Locally Convex Spaces (Teubner Texts).
3. Schaefer, H,H.: Topological Vector Spaces (Springer Verlag).
4. Bachman, G & Narici, L: Topological Vector Spaces (Marcel Dekker).