Course No.	Course Title	L-P-T	Credits
UMAT0O023T	**Topological Vector Spaces**	3-0-1	4

OBJECTIVES: The aim of this course is to teach the students the about the properties and applications of the topological vector spaces.

CO 01	Learn about topological vector Spaces, Gauge of a Convex, balanced and absorbing set.
CO 02	Understand the Linear variety, Hyper plane, Geometric form of Hauh Banach theorem
CO 03	Learn sbout Weak-* topology, f-typology and the Banach Alaoglu Theorem
CO 04	Kerin-Milan theorem, Baire's category theorem, closed Graph theorem and their applications
CO 05	Understand the absolutely convex set, Polar of a set, Bipolar theorem, Barrelled space, Bornivorne or Born logical space

Course contents

Unit-1

Semi norm, Topological vector spaces, Convex set, Balanced Set, Absorbing Set, Minkow Ski Functional (Gauge), Topology in a semi –norm , Linear space, Semi normed linear space, locally convex space.

Unit -2

Linear Transformation, Linear functional, Maximal subspace, linear variety, Hyper Plane, Geometric horm of Hahn Banach Theorem and its applications.

Unit-3

Reflexive Banach space, Canonical embedding, Milman's Theorem, Weak Topology, Basic neighbourhoods, Weak*-topology, F-topology, The Banach Alaoglu theorem, Extreme points, Extreme Subset.

Unit-4

Krein- Milman Theorem, Baire's Category theorem, Closed Graph theorem Application of Closed graph theorem, Frechet space, open Mapping theorem for Frechet Space

Unit-5

Absolutely convex set, Duality, Linear form, Weak topology, polar of a set, Bipolar theorem, Barrelled space, Bornivorous or bornivorne, Bornological space.

Reference Books:

1. **Larse, R.,** Functional Analysis: an introduction, M Dekker 1973
2. **Schaefer, H.H.,** Topological Vector Spaces, Springer 1999
3. **Rudin, Walter**, Functional Analysis(2nd edition), MC graw- Hill, 1991

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