20MSM509T					Topology					
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs. / Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
3	1	0	4	4	25	50	25	--	--	100

COURSE OBJECTIVES

- To be able to gain knowledge of topological spaces with different characteristics.
- To be able to work out the product of two spaces and the role of bounded sets in pure mathematics
- To be able to relate the compactness and different sets.
- To study separable and regularity axioms and their significance.

UNIT 1 TOPOLOGICAL SPACES **10 Hrs.**

Topological Spaces, Bases, Subspace, Closed Sets, Open Sets, Interior, Closure, Limit point,Boundary of a set. T1, T2-spaces, Continuous functions, Pasting Lemma

UNIT 2 PRODUCT SPACES AND BOUNDED SETS **12 Hrs.**

Product space, Projections, Weak topology, Product of T1, T2-spaces, Metric topology, Basicconcepts and sequences, Continuity and uniform continuity, Bounded subsets, Totally boundedsubsets.

UNIT 3 COMPACT SPACES **08 Hrs.**

Compact topological spaces, Finite Intersection Properties, Hausdorff and Compactness,Compact metric spaces, Heine-Borel Theorem.

UNIT 4 REGULAR, COUNTABLE AND SEPARABLE SPACES **10 Hrs.**

Regular, Normal, Completely regular spaces, Compact Hausdorff spaces, Second Countablespace, separable space, second Countability and Separability in metric space.

40 Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1 – Identify variety of spaces in Topological aspect.
CO2 – Understand the concept of closed and opens sets in different contexts and continuous functions in topology. .
CO3 – Explain various metric topologies and demonstrate the uniform continuity.
CO4 – Analyze the compactness of a topological space and to justify whether the space is Hausdorff or not.
CO5 – Appraise the significance of Heine-Borel theorem and the connection with different topological spaces.
CO6 – Evaluate regularity, countability and separability of various spaces.

TEXT/REFERENCE BOOKS

1. Simmons G F, Introduction to Topology and Modern Analysis, McGraw-Hill Co., Tokyo, 1963.
2. Munkres, J, Topology: A First Course, Prentice Hall of India Pvt. Ltd., New Delhi, 2000.
3. Kumaresan S., Topology of Metric Spaces, Narosa Publication, New Delhi, 2011.
4. Joshi K.D., Introduction to General Topology, New Age Publishers, New Delhi, 1983.