Course No	Course Name	L-T-P-Credits
MA 532	**Topology**	**3-0-0:3**

Prerequisite: nil

Course Objectives:	The aim of the course is to provide for the students an introduction to theory of topological spaces building foundation for higher studies in pure mathematics.
Course Outcomes:	1. Understand a topological space and provide examples of standard topological spaces.
	2. Understand basis and sub basis of topological spaces and should be able to produce bases and sub bases of various standard topological spaces.
	3. Demonstrate the understanding o open sets, closed sets and related concepts.
	4. Understand subspace topology and related result.
	5. Demonstrate the understanding of product space and quotient space.
	6. Use continuous functions and homeomorphisms to understand structure of topological spaces.
	7. Demonstrate knowledge and understanding compact and connected topological spaces.
	8. Apply theoretical concepts in topology to understand real world applications.

SYLLABUS

Module	Contents	Hours
I	Definition and examples of topological spaces, basis and sub basis, order topology, subspace topology, closure, limit point, boundary, interior.	6
II	Continuity and related concepts, product topology,metric topology, quotient topology, countability axioms, Lindel of spaces and separable spaces.	8
III	Connected spaces and connected sets, component, path connectedness, path component, local connectedness, local path connectedness.	5
IV	Compact spaces and compact sets, limit point compact and sequentially compact spaces, locally compact spaces, one point compactification, finite product of compact spaces, statement of Tychonoff's theorem.	5

| V | Separation axioms, Urysohn's lemma, Tietze's extension theorem, statement of Urysohn's metrization theorem. | 3 |

Essential Readings:

1. J. R. Munkres, "Topology", Pearson Education India; 2ndedition, 2015
2. G. F. Simmons, "Introduction to Topology and Modern Analysis", McGraw Hill Education, 1stedition, 2017

Supplementary Readings:

1. C. W. Patty, "Foundations of Topology", Jones & Bartlett Publishers, 2010.
2. K. D. Joshi, "An Introduction to General Topology", New Age International Private Limited, 2017