MANGALORE UNIVERSITY

DEPARTMENT OF MATHEMATICS

MSC MATHEMATICS

MTH 454	Topology	4 Credits (48 hours)

Course Outcome: To study topological spaces, continuous functions, connectedness, compactness, countability and separation axioms.

Course Specific Outcome: At the end of the course Students will have the knowledge and skills to**e**xplain Demonstrate accurate and efficient use of the following advanced topics in various situations -

- Elementary concepts, Open bases and open subbases, Weak topologies
- The function algebras $C(X, \mathrm{R})$ and $C(X, \mathrm{C})$
- Countability axioms and Separability axioms
- Urysohn's lemma, Tietze extension theorem, and theUrysohn imbedding theorem.
- Connected spaces, the components of a space, totally disconnected spaces, locally connected spaces.

Unit I - Topological Spaces:

The definition and some examples, Elementary concepts, Open bases and open subbases, Weak topologies, The function algebras $C(X, R)$ and $C(X, C)$.

(15 Hours)

Unit II - Compactness:

Compact Spaces, Product spaces, Tychonoff 's theorem.

(10 Hours)

Unit III - Separation:

T_1-Spaces and Hausdorffspaces, Completely regular spaces and Normal spaces, Urysohn's lemma and Tietze extension theorem, The Urysohn imbedding theorem.

(13 Hours)

Unit IV - Connectedness:

Connected spaces, The components of a space, Totally disconnected spaces, Locally connected spaces.

(10 Hours)

References

[1] G. F. Simmons, *Introduction to Topology and Modern Analysis*, Tata McGraw-Hill, 2004.

[2] J. R. Munkres, *Topology*, 2nd Ed., Pearson Education, Inc, 2000.

[3] S. Willard, *General Topology*, Addison Wesley, New York, 1968.

[4] J. Dugundji, *Topology*, Allyn and Bacon, Boston, 1966.

[5] J. L. Kelley, *General Topology*, Van Nostrand Reinhold Co., New York, 1955.