**MA5701 Topology**

Definition and examples of topological spaces, closed sets, closure, dense subsets, neighbourhood, interior, exterior and boundary, accumulation point, derived set, bases and subbases, subspace topology, finite product of topological spaces, alternative methods for defining a topology in terms of Kuratowski closure operator and neighbourhood system.

Open, closed and continuous functions and homeomorphism, topological invariants, isometry and metric invariants.

**Countability Axioms :** First and second countability, separability and Lindel¨of property.

**Separation Axioms :** Ti-property (i = 0, 1, 2, 3, 3 1/2, 4, 5), regularity, complete regularity, normality and complete normality; their characterizations and basic properties, Urysohn’s lemma, Tietze’s extension theorem, T5-property of a metric space.

**Compactness :** Characterizations and basic properties, Alexander subbase theorem, compactness and separation axioms, compactness and continuous functions, sequentially, Frechet and countably compact spaces, compactness in metric spaces.

**Connectedness :** Connected sets and their characterizations, connectedness of the real line, components, totally disconnected space, locally connected space, path connectedness, path components, locally path connected space.

**References:**

1. G.F. Simmons, Introduction to Topology and Modern Analysis, McGraw Hill, 1963.

2. James R. Munkres, Topology, Second Edition, Prentice Hall, 1999.

3. Stephan Willard, General Topology, Dover, 2004.

4. Kelly J. L. General topology. Graduate Texts in Mathematics, No. 27. Springer-Verlag, New York-Berlin, 1975

5. M. A. Armstrong, Basic Topology, Springer (India), 2004