

## General Topology - MA406

This file contains a short description of the material covered in each of the lectures.

- Lecture 1 - Definition of a topology and some very basic examples.
- Lecture 2 - Some more examples, standard topology on  $\mathbb{R}^n$ .
- Lecture 3 - Basis and how to construct topologies using a basis.
- Lecture 4 - Subspace topology.
- Lecture 5 - Product topology and examples of topologies using product and subspace topology.
- Lecture 6 - Continuous maps between topological spaces. Explain how to give a continuous map to a product of topological spaces.
- Lecture 7 - The ring of continuous functions on a topological space.
- Lecture 8 - Example of projecting from a point. Define homeomorphisms.
- Lecture 9 - Closed subspaces, closure of a subspace.
- Lecture 10 - Metric spaces.
- Lecture 11 - Connectedness.
- Lecture 12 - Path connectedness.
- Lecture 13 - Hausdorff topological spaces, compact topological spaces.
- Lecture 14 - Criterion for a metric to be compact.
- Lecture 15 - Locally compact topological spaces and one point compactifications.
- Lecture 16 - Universal property of one point compactification. Quotient Topology, universal property of quotient topology.
- Lecture 17 - Normal spaces. Urysohn's Lemma.
- Lecture 18 - Extension Theorems. Second countable spaces.
- Lecture 19 - Urysohn's Metrization Theorem.