# Department of Mathematics Faculty of Science

**MATH 713 (206713) TOPOLOGY 3(3-0-6)  
Prerequisite** Consent of the instructor

**Course Descriptions :**

Topological spaces. Cartesian Product Topology. Connectedness and path - connectedness. Identification Topology. Separation Axioms. Convergence. Compactness.

**Course Contents No. of Lecture Hours**

1. Topological space 4

1.1 Topological space and subspaces.

1.2 Basis for a given topology.

1.3 Continuous maps, open maps, closed maps.

1.4 Homeomorphism.

2. Cartesian Product 4

2.1 Cartesian product topology.

2.2 Slices in cartesian product.

- Continuity of maps.

3. Connectedness 7

3.1 Connectedness.

3.2 Components.

- Local connectedness.

- Path - connectedness.

4. Identification Topology 6

4.1 Identification topology.

4.2 Subspaces.

- General theorems.

- Spaces with equivalent relations.

- Quotient spaces.

- Weak topologies.

**Course Contents No. of Lecture Hours**

5. Separation Axioms 10

5.1 Housdorff spaces

5.2 Regular spaces.

- Normal spaces.

- Urysohn's characterization of normality.

- Tietze's caracterization of normality.

- Completely Regular Spaces.

6. Convergence 7

6.1 Sequences and nets

6.2 Filterbases in spaces

- Convergence properties of filterbases

- Closure in term of filterbases

- Continuity convergence in Cartesian Products

- Maximal Filterbases

7. Compactness 7

7.1 Compact spaces.

7.2 Special properties of compact spaces.

- The Tychonoff theorem.

- countable compactness.

- Local compactness.

**Total 45**