# 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**