



Course No.	Course Title	No. of Units			Pre-requisites
		Th.	Pr.	Credit	
MATH 471	Discrete Mathematics	3	-	3	MATH 151

Course Objectives:

The objectives of this course are as follows:

- To introduce to the students the basic concepts of Discrete Mathematics and its applications.
- To improve the students logical thinking and dexterity in solving problems.
- For instance to understand how the cardinalities of natural and rational numbers are equal while that of real numbers is different.
- To introduce to the students graph theory with several applications and several algorithms.
- They must learn in this course the concept of abstract machines, the languages and grammars.
- They can use these concepts to understand problems and theory in computer science, abstract algebra, real and complex analysis, topology, manifolds, etc.

Course Description:

Fundamentals of discrete mathematics, Countable and uncountable sets, Pigeonhole principle, Lattices and Boolean algebras, Graph theory, Graphs, Digraphs, paths, Circuits, connectivity, Euler and Hamiltonian paths, Shortest path problem, planar graphs, Euler's formula for connected planar graphs, Kuratowski's theorem, Trees, Spanning trees, Trees, Various algorithms, Computability theory, Finite state machines, Languages, grammars.

Main Text Book:

- Discrete Mathematics and its Applications, by Kenneth H. Rosen, 6th edition, McGraw Hill, 2007.

Subsidiary Books:

- Discrete and combinatorial mathematics: an applied introduction, by R. P. Grimaldi, Pearson; 5th edition 2003.