

Uka Tarsadia University



B. Tech

Discrete Mathematics

(030090401)

4th Semester

EFFECTIVE FROM January-2013

A. Prerequisite: Nil

B. Aim and Objective: To study fundamental concepts of engineering mathematics, so that students get sound knowledge and aspects of the subject.

C. Subject Code: 030090401

Subject: Discrete Mathematics

D. Total: 65 Hrs. [Lecture: 4 Tutorial: 1 Practical: 0]

E. Detailed Syllabus:

Sr. No.	Topic Name	Weightage (%)
1.	Graph Theory	20
1.1	Graphs, Definition & basic concepts of finite & infinite graph, Incidence & Degree, Isomorphism, Subgraph, Walk, Path & circuits, Operations on graphs, connected graph, Disconnected graph & components, Complete graph, Regular graph, Bipertite graph, Euler's graph, Hamiltonian paths & Circuits, Weighted graphs, Applications, Directed & Undirected graphs, Connectivity of graphs	
2.	Trees	20
2.1	Definition & properties of trees, Pendent vertices in a tree, Distance between two vertices Centre, Radius & diameter of a tree, Rooted & binary trees, Representation of Algebraic structure by Binary trees, Binary search trees, Spanning trees & fundamental circuits	
3.	Relation & Lattices	10
3.1	Definition & Basic properties, Graphs of relation, Matrices of relation, Equivalence relation, Equivalence classes, Partition, Partial ordered relation, Posets, Hasse diagram, Upper bounds, Lower bound, GLB & LUB of sets	

4.	Roots of equation and Linear algebraic equation	10
4.1	Definition & properties of Lattice, Sub lattice, Distributive & modular lattices, complemented & Bounded Lattices, complete lattices & Boolean algebra	
5.	Group theory	20
5.1	Basic properties of Group, Groupoid, semigroup & monoid, Abelian group, Subgroup, Cosets, Normal subgroup, Lagrange's theorem, Cyclic group, Permutation group, Homomorphism & Isomorphism of groups, Basic properties	
6.	Mathematical logic and Program verification	20
6.1	Propositions, logical operators & propositional algebra, Predicates & quantifiers, Interaction of quantifiers with logical operators, Logical interference & proof techniques, Formal verification of computer programs (elements of Hoare logic)	

F. Modes of Transaction (i.e. Delivery)

Various methods of teaching could be employed depending on the objectives of the content taught.

1. At the start of course, the course delivery pattern, prerequisite of the subject will be discussed
2. Lectures will be conducted with the aid of multi-media projector, black board, OHP etc
3. Attendance is compulsory in lectures/tutorial which carries a 5% component of the overall evaluation
4. Minimum two internal exams will be conducted and average of two will be considered as a part of 15% overall evaluation
5. Assignments based on course content will be given to the students at the end of each unit/topic and will be evaluated at regular interval. It carries a weight age of 5%
6. Two Quizzes (surprise test) will be conducted which carries 5% component of the overall evaluation

G. Teachers Activities/Practicum

The following activities should be carried out by the teachers

1. Interactive teaching should be employed so that students can understand completely
2. Trial and error technique should be taught to students

H. Student Activities/Practicum

The following activities may be carried out by the students

1. Students should try to relate their mathematics knowledge to the problems of their respective field
2. Projects work should be done so that application of mathematics could be thoroughly understood

I. Text Books

1. Discrete Mathematics by J K Sharma
Publisher: Macmillan India Limited , ISBN-13:978140392475

J. Reference Books

1. Rosen K.H., "Discrete Mathematics and Its Applications", 6/E, MGH, 2006
2. Kolman B., Busby R.C. & Ross S., "Discrete Mathematical Structure", 5/E, PHI, 2003
3. Tremblay J. P. & Manohar R., "Discrete Mathematical structure with applications to computer science", MGH, 1999
4. DeoNarsingh., "Graph theory with applications to Engineering & Computer Science", PHI, 2000
5. Liu C.L., "Elements of Discrete Mathematics", MGH, 2000.)