

MANDSAUR UNIVERSITY - Faculty of Engineering and Technology

Department of Mathematics

SYLLABUS FOR 3 Semester B.Tech PROGRAMME

Discrete Mathematics (MAT220 TR1)

Type of Course: B.Tech

Prerequisite:

Rationale: -

Teaching and Examination Scheme:

Teaching Scheme			Credit	Examination Scheme					Total
Lecture Hrs/ Week	Tutorial Hrs/ Week	Lab Hrs/ Week		External		Internal			
				TH-EST	PR-EST	Th - MST	CET	Pr - MST	
2	1	-	3	60	-	30	10	-	100

SEE - Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)

Contents:

Sr.	Topic	Weightage	Teaching Hrs.
1	Unit I: Set Theory, Theorem proving Techniques, Recurrence relation: Introduction to Sets, Finite and Infinite Sets, Unaccountably Infinite Sets. Introduction to Functions and relations, Properties of Binary relations, Partial Ordering Relations. Pigeonhole Principle, Mathematical Induction, Principle of Inclusion and Exclusion.	12%	12
2	Unit II: Logic set and Theory: Proposition, First order logic, Basic logical operation, truth tables, tautologies, Contradictions, Algebra of Proposition, logical implications, logical equivalence, predicates, Normal Forms, Universal and existential quantifiers.	13%	12
3	Unit III: Algebraic structures: Definition, Properties, types: Semi Groups, Monoid, Groups, Abelian group, properties of groups, Subgroup, cyclic groups, Cosets, factor group, Permutation groups, Normal subgroup, Homomorphism and isomorphism of Groups, example and standard results. Rings and Fields: definition and standard results.	25%	12
4	Unit V: Graph Theory: Introduction of graphs, pseudographs, complete graphs, bipartite graphs, isomorphism of graphs, paths and circuits, Eulerian circuits, Hamiltonian cycles, the adjacency matrix, weighted graph, travelling salesman's problem, shortest path, Dijkstra's algorithm, Floyd-Warshall algorithm. Trees, Properties of Trees, Distance and Centres in a tree, Spanning trees of a graph and weighted graph.	25%	12
5	Unit IV: Recurrence Relation: Recurrence Relation, Linear recurrence relations with constant coefficients, Homogeneous solutions, Particular solutions, Total solutions, Generating functions, Solution by method of generating functions.	25%	12

***Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

Reference Books:

1. Elements of Discrete Mathematics (TextBook)
By C L Liu | Tata McGraw Hill
2. A Text Book of Discrete Mathematics (TextBook)
By Swapan Kumar Sarkar | S. Chand