

Course Code	EM 214			
Course Title	Discrete Mathematics			
No. of Credits	3			
Pre-requisites	-			
Compulsory/Optional	Compulsory for Computer Engineering specialization			
Aim(s): To solve problems related to propositional and predicate calculus, mathematical models for computing machines and algorithms using fundamentals of number theory, algebraic structures, Boolean algebra and graph theory.				
Intended Learning Outcomes: On successful completion of the course, the students should be able to;				
<ul style="list-style-type: none"> • Apply the concepts of number theory and algebraic structures to solve advanced mathematical / physical problems. • Simplify and evaluate statements in propositional and predicate logic and check the validity of an argument. • Solve advanced mathematical and physical problems. Using graph theory and algorithms. 				
Time Allocation (Hours): Lectures 36 Tutorials 09 Practicals Assignments				
Course content/Course description				
<ul style="list-style-type: none"> • Fundamentals: set theory, relations and functions, axiomatic systems, ordinary Induction, invariants, strong induction. • Number Theory: Divisibility, the greatest common divisor, Modular arithmetic, Fermat's Little theorem, RSA algorithm • Algebraic Structures: Monoids, groups, rings and fields. • Combinatorics: Basic counting principles with permutations and combinations, basic combinatorics. • Logic and Proofs: propositional and predicate logic, proof methods and strategy. • Graph Theory: graphs, representation of a graph in a computer, isomorphic graphs, Eulerian and Hamiltonian graphs, planar graphs, graph coloring, trees, spanning trees, binary trees, tree searching, Hasse diagrams. • Algorithms: greedy algorithms, searching and sorting algorithms, algorithms to obtain minimum spanning tree and shortest path of a weighted graph, complexity of an algorithm. • Mathematical models for Computing Machines: finite state machines, finite state automata, Turing machines. 				
Recommended Texts :				
<ul style="list-style-type: none"> • D. K. Joshi, Foundations of Discrete Mathematics, (1989/2015), Wiley-Inter Science. • D. K. Joshi, Applied Discrete Structures, (2001/2014), New Age International. • Thomas Koshy, Discrete Mathematics with Applications, 1st edition, (2004), Elsevier Academic Press. • Ian Anderson, A First Course in Discrete Mathematics, (2001), Springer-Verlag. 				

London Limited.

- Kenneth.H.Rossen Discrete Mathematics and Applications, (2002),McGraw-Hill Higher Education.

Assessment	Percentage Mark
In-course Tutorials/Assignments Mid Semester Examination	20 30
End-semester	50