Date : 03/08/2012

In addition to Part-I (General Handout for all courses appended to the Timetable) this portion gives further specific details regarding the course.

Course No.   : CS F222 / IS F222 / MATH C222
Course Title   : Discrete Structures for Computer Science
Instructor In Charge   : Dr. N.L.BHANU MURTHY
Team of Instructors   : Rakesh Prasanna Chennupati
                            Abhishek Thakur

1. COURSE DESCRIPTION :
Sets & operation on sets; relations & equivalence relations; number theory; weak & strong form of mathematical induction; principle of inclusion & exclusion, pigeonhole principle; recurrence relations & generating functions; digraphs & graphs, graph isomorphism & sub-graphs, spanning trees, Euler & Hamiltonian graphs, planar graphs, chromatic numbers & graph coloring; groups; Lagrange theorem finite groups; Rings & Fields.

2. SCOPE & OBJECTIVE   :
This course aims to provide the mathematical foundations for many computer science courses including data structures, algorithms, databases theory, automata theory, formal languages, compiler theory, computer security, and operating systems. This course can develop mathematical maturity to understand and create mathematical arguments. The course encompasses topics like methods of proof (induction, contradiction, proof by cases etc), set theory, functions, relations, partially ordered sets, lattices, graph theory, basic number theory and its application to cryptography, algebraic structures & coding theory.

3. TEXT BOOK :
T1. Mott , Abraham & Baker : Discrete Mathematics for computer scientist & Mathematicians, PHI, 2nd edition 2002.

4. REFERENCE BOOK :
R1. Kenneth Rosen: Discrete Mathematics and its applications, seventh editions, Tata McGrawHill Education Private Limited.
R2. KOLMAN , BUSBY & ROSS : Discrete Mathematical Structures , PHI 2003
R3.   ROSS & WRIGHT : Discrete Mathematics PHI 2nd edition , 1988.

5. COURSE PLAN :

Subject	Ref.	Lecture n.
Introduction	Lecture Notes	1
Methods of proof (Week and Strong Induction, Contradiction, Proof by cases etc)	T1 – Ch. 1.7, Ch. 1.10 / R1 – Ch. 1.8, Ch.4.1 to 4.3	2 - 3
Set Theory & Functions	T1 – Ch. 1.2, 1.3 / R1 – Ch. 2.1 to 2.3	4 – 5
Relations, Equivalence Relations, Partially Ordered Sets, Lattice Theory	T1 – Ch. 1.3, Ch. 4 / R1 – Ch. 7	6 – 11
Graph Theory (Basic Concepts, Isomorphism, Subgraphs, special graphs, Planer graphs, Multigraph & Eulerian & Hamiltonian graphs)	T1 - Ch. 5 / R1 – Ch.8	12 – 18
Trees, Spanning Tree of graphs and algorithms to find minimum spanning tree(s) of graph.	T1 - Ch. 5 / R1 – Ch. 9	19 – 22
Recursion, Recurrence Relations & Generating Functions	T1 - Ch.3.3 to 3.6 / R1 – Ch. 4.3 & 4.4, Ch. 6.1 & 6.2	23 – 25
Combinatorics (Simple & Generalized Pigeonhole Principle, Inclusion-Exclusions etc)	T1 – Ch.2 / R1 – Ch.5.1 to 5.3	26 – 28
Basics in Number Theory - Primes, Factorization, GCD, Residues and application to cryptography	R1 – Ch. 3.4 to 3.7	29 - 34
Algebraic Structures (Monoids, SemiGroups, Groups , Rings, Fields) and coding theory	R1 – Ch.11	35 -40

6. EVALUATION SCHEME :

Component	Duration	Weightage(%)	Date & Time	Remarks
Test I	50 mts	25	24/09 9.30 – 10.30AM	CB
Test II	50 mts	25	05/11 9.30 – 10.30AM	CB
Comprehensive Examination	3 hr	50	12/12 AN	Part Open

7. CHAMBER CONSULTATION HOUR: Thursday 1600 Hrs – 1700Hrs @B219

8. Make-up: Make-up will be granted only to genuine cases with prior permission only.

9. NOTICES: All notices about the course will be put on CSIS Notice Board.

Instructor –in-charge
CS C222 / IS C222 / MATH C 222