Birla Institute of Technology & Science, Pilani
Hyderabad Campus

INSTRUCTION DIVISION
FIRST SEMESTER 2016-2017
Course Handout Part II

Date: 01-08-2016

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

Course No. : *MATH F213*
Course Title : Discrete Mathematics
Instructor-in-Charge : P K Sahoo

Scope and Objective of the Course: Mathematics, described as a language of science, has acquired its unique position due to its precision and rigour. This makes essential the development of the sense for mathematical rigour as well as the habit of mathematical thought process. The course will achieve this by introducing the students to propositional and predicate logic. As an important follow-up, various methods of proof will be discussed. Several mathematical structures like relations and orderings are studied due to their importance, not only in mathematics but also applied subjects like computer science. The course is also useful to prepare for the study of computational study of concepts, techniques, and skills necessary to comprehend the structure of problems encountered in design and analysis of algorithms.

Textbooks:

1. Joe L. Mott, Abraham Kandel & Theodore P. Baker: Discrete Mathematics for Computer Scientist & Mathematicians PHI, 2nd Edition 2010.

Reference books

R1. KOLMAN, BUSBY & ROSS: Discrete Mathematical Structures, Pearson Education, 3rd Edition, 2007

R2. K H Rosen: Discrete Mathematics & its Applications, TMH, 6e, 2007.

Course Plan:

Lecture No.	Learning objectives	Topics to be covered	Chapter in the Text Book
Self Study	To learn the basics that are needed for this course	Sets and Operations of sets, Relations and Functions	Chap 1, Sec:1.1 to 1.3
1-5	To learn the concepts of logic	Logic, logical inferences, methods of proof, Pigeonhole principle	Ch.1 sec. 1.5-1.7
6-10		First order logic & other methods of proof, quantifiers, Mathematical Induction, strong form of mathematical induction	Ch.1 sec.1.8-1.10
11-16	To learn the concepts of Permutations and Combinations	Elementary Combinatorics, Enumeration of Combinations and Permutations with repetitions and with constrained repetitions.	Ch.2
17-21	To learn recursive relations	Recurrence relations & solving recurrence relations with generating functions	Ch.3 sec.3.1-3.4
22-23		Method of characteristic roots for solving recurrence relations	Ch.3 sec.3.5
24-25		Solving inhomogeneous & nonlinear recurrence relations	Ch.3 sec.3.6
26-31	To learn the concept of relations and the connection between the directed graphs and relations	Relations & directed graphs, equivalence relations, partially ordered set, totally ordered set, Hasse diagrams, well ordered set, lattice theory	Ch.4 sec.4.1-4.4
32-35		Operations on Relations, paths and closures, adjacency matrices, Warshall's algorithm	Ch.4 sec. 4.5-4.7
36-40	To learn concepts Boolean algebra and its applications in circuits	Boolean Algebra, Boolean functions, switching circuits.	Ch.6 sec.6.1-6.5

Evaluation Scheme:

Component	Duration	Weightage (%)	Date & Time	Nature of Component
Test I	1Hr.	30	10/9, 4.00--5.00 PM	Closed Book
Test II	1Hr.	30	22/10, 4.00--5.00 PM	Open Book
Compre. Exam	3 hrs	40	01/12 AN	Closed Book

Chamber Consultation Hour: To be announced in class
Notices: All notices related to the course will be put up on the notice board of the Mathematics department.
Make-up Policy: Prior permission needed for make-up.

INSTRUCTOR-IN-CHARGE