BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI- HYDERABAD CAMPUS
FIRST SEMESTER 2019-2020
COURSE HANDOUT (PART-II)

01-08-2019

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 **: B. Mishra**
Instructor **:** B. Mishra, K. Venkata Ratnam

1. 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.

2. Textbooks:

1. Joe L. Mott, Abraham Kandel, Theodore P. Baker: Discrete Mathematics for Computer Scientist & Mathematicians, Pearson, 2nd Edition 2015.

3. Reference books

R1. Kolman, Busby, Ross: Discrete Mathematical Structures, Pearson Education, 6th Edition, 2015.
R2. K H Rosen: Discrete Mathematics & its Applications, TMH, 6e, 2007.

4. 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
36-42	To learn concepts Boolean algebra and its applications in circuits	Boolean Algebra, Boolean functions, switching circuits.	Ch.6 sec.6.1-6.5

5. Evaluation Scheme:

Component	**Duration**	**Weightage (%)**	**Date & Time**	**Nature of Component**
Mid-Semester	1 Hour 30 Minutes	35	5/10, 9.00 -- 10.30 AM	Closed Book
Quizzes (Five) Best Four would be considered	To be announced	20		Closed Book
Comprehensive Exam	3 Hours	25 20	13/12 FN	Closed Book Open Book

6. Chamber consultation Hour: To be announced in the class.

7. Notice: Notice, if any, concerning this course will be displayed only in CMS.

8. Make up: Prior permission is needed for make up; make up will only be given if enough evidence is there for not being able to take regular test.

9. **Academic Honesty and Integrity Policy:** Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

Instructor-in-charge
MATH F213