



**INSTRUCTION DIVISION
FIRST SEMESTER 2016-17
COURSE HANDOUT(PART-II)**

August 3, 2016

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. : MATH F213
Course Title : Discrete Mathematics
Instructor In Charge : RAJIV KUMAR

1. COURSE DESCRIPTION:

Language of Mathematics, sets & operations on sets, relations & equivalence relations, elementary logic, propositions, informal proof, logical equivalence, weak- strong form of mathematical induction, pigeonhole principle, elementary combinatorics, principle of inclusion and exclusion, recurrence relations, partial ordering, Boolean algebra.

2 SCOPE & OBJECT

The course is helpful in the study of computational systems & study of concepts, techniques, and skills necessary to comprehend the structure of problems encountered in design and analysis of algos. To provide mathematical foundations, that rely upon the comprehension of formal abstract concepts. For objectives course will train students in informal notation for propositional logic. To construct formal proofs in propositional logic, negation of a statement that is needed in mathematical reasoning. To prove theorems with the techniques of direct proof, proof by contraposition, proof by contradiction and proof by induction, recursive definitions and to write recursive definitions for certain sequences and collections of objects. Generating function & recurrence relation Several mathematical structures like relations and partial order, Boolean algebra are studied as they are needed not only in mathematics but also in computer science.

3. TEXT BOOK:

Mott, Kandel, & Baker : Discrete Mathematics for Computer Scientists & Mathematicians
PHI, 3e, 2003.

4. REFERENCE BOOKS:

- R1.** Liu: Elements of Discrete Mathematics, McGraw Hill, 3e, 1983
R2 Goodaire & Parmenter : Discrete Mathematics, PHI,

5. COURSE PLAN:

Topics	Ref.	Lecture n.
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Introduction & Overview	Ch. 1 art 1-4	1
Logic, logical inferences, methods of proof, Pigeon hole principle	Ch.1 art. 5-7	2-5
First order logic & other methods of proof, quantifiers, Mathematical Induction, strong form of mathematical induction	Ch.1 art. 8-10	6-10
Recurrence relations & solving recurrence relations with generating functions	Ch.3 art.1-4	11-15
Method of characteristic roots for solving recurrence relations	Ch.3 art.5	16-18
Solving inhomogeneous & nonlinear recurrence relations	Ch.3 art.6	19 -20
Relations & directed graphs, equivalence relations, partially ordered set, totally ordered set, Hasse diagrams, well ordered set	Ch.4 art. 1-4	21-26
Operations on Relations, paths and closures, adjacency matrices.	Ch.4 art. 5-7	27-30
Boolean Algebra, Boolean functions, minimal Boolean expression, karnaugh map	Ch.6 art. 1-4	31-35
Enumeration of Combinations and Permutations with repetitions and with constrained repetitions.	Ch . II	36-40

6. EVALUATION SCHEME:

Component	Time	weightage	Date & Time	Remarks
Test	90 minute	30%		Closed book
Quiz	Regular	30%		open
Comprehensive	3 hours	40%		closed

7. CHAMBER CONSULTATION HOUR: To be announced in class

8. MAKE-UP Policy: Prior permission needed for make-up.

9. NOTICES: All notices related to the course will be put up on MATH NB normally information will be passed in the class.

**Instructor-in-charge
MATH F213**



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