

BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI
FIRST SEMESTER 2015-2016
INSTRUCTION DIVISION

COURSE HANDOUT (PART-II)

Date: 29/07/2015

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	: SK Hafizul Islam
Team of Instructors	: Pranjali Ranjan (pranjali.ranjan@pilani.bits-pilani.ac.in) Nitin Rajput (nitin.rajput@pilani.bits-pilani.ac.in) Gaurav Kumar (gauravrajson@gmail.com)

1. COURSE DESCRIPTION:

Sets & operation on sets; relations & equivalence relations; 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 & coloring; groups, finite groups, Lagrange theorem, Boolean algebra.

2. SCOPE & OBJECTIVE:

To develop logical and mathematical concepts necessary to appreciate computational systems and study of concepts, techniques, and skills necessary to comprehend the structure of problems encountered in design and analysis of algorithms. To provide mathematical foundations for courses in computer science those rely upon the comprehension of formal abstract concepts. To study recursion and to write recursive definitions for certain sequences and collections of objects. Graphs, directed graphs, planar graphs & their relevance to circuit design & map coloring problems. Basic concepts of group theory and Boolean algebra.

3. TEXT BOOK:

T1: Mott, Kandel, & Baker : Discrete Mathematics for Computer Scientists & Mathematicians, PHI, 2e, 2002.

(https://drive.google.com/file/d/0By8B-hms3_UVTJHMuIGMkxFNkE/view)

4. REFERENCE BOOKS:

R1: C L Liu: Elements of Discrete Mathematics, McGraw Hill, 2e, 1985

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

R3: Bisht & Dharmi: Discrete Mathematics, Oxford University Press, 1e, 2015.

5. COURSE PLAN:

Topic	Ref.	Lecture #
Introduction & Overview	T1:Ch.1	1
Set Theory	T1:Ch.1. 2	2-3
Mathematical Induction, Strong form of mathematical induction	T1:Ch.1.10	4-5
Recurrence relations & solving recurrence relations with generating functions	T1:Ch.3.2-3.4	6-9
Method of characteristic roots for solving recurrence relations	T1:Ch.3.5	10-11
Solving inhomogeneous & nonlinear recurrence relations	T1:Ch.3.6	12-13
Relations & directed graphs, equivalence relations, partially ordered set, totally ordered set, Hasse diagrams, well ordered set, applications	T1:Ch. 4	14-19
Graphs: Basic concepts	T1:Ch.5.1	20-22
Isomorphism, Subgraphs, & special graphs	T1:Ch.5. 2	23-25
Trees, spanning trees, Binary & directed trees	T1:Ch.5.3-5.6	26-29
Planar graphs, multigraphs & Eulerian & Hamiltonian graphs	T1:Ch.5.7-5.10	30-34
Boolean Algebra: Basic concepts	T1:Ch.6, R1:Ch.12	35-37
Group, group isomorphism, cyclic groups, subgroups & Lagrange theorem. Rings, fields, & finite fields	R1:Ch.11	38- 40

6. EVALUATION SCHEME:

Component	Weightage	Date Hr (Time)	Duration	Remarks
Assignment/Quiz/Surprise Tute Quiz Test*	25%		NA	Closed
Mid Sem	30%	7/10 2:00 - 3:30 PM	90 mins.	Partly Open Book
Comprehensive	45%	7/12 FN	3 hours	Closed Book

***Please see Make-up policy.**

7. NOTICES: All notices related to the course will be put up on the CSIS / IPC Notice Board only.

8. CHAMBER CONSULTATION HOUR: Friday 4:00 PM – 5:00 PM.

9. MAKE-UP Policy: Best five (05) among seven (07) Surprise Tute Quiz Test will be considered, therefore, there is no need for makeup. For the make-up of Mid Sem and Comprehensive Examination, the approval of Dean, Instruction Division is needed.

Instructor–In-Charge

