

LESSON PLAN FOR IT-III SEMESTER

SUBJECT: FOUNDATION OF COMPUTER SCIENCE

Subject Code: ETCS-203

Total Lecture Classes Available: 39

L T C

3 1 4

Total Teaching Weeks in Semester: 15 Weeks

Total Tutorial Classes: 16

| S. No. | Topics to be Covered | Lectures | Tutorials |
|--------------------------|--|----------|-----------|
| MID TERM SYLLABUS | | | |
| 1 | Formal Logic: Proposition, Symbolic Representation | 1 | |
| 2 | Logical Entailment Theory of Inferences and Tautologies | 2 | 1 |
| 3 | Predicates, Quantifiers, | 1 | 1 |
| 4 | Theory of Inferences for Predicate Calculus, Resolution | 3 | 1 |
| 5 | Techniques for Theorem Proving: Direct Proof, Proof by Contraposition, Proof by Contradiction | 2 | 1 |
| 6 | Principle of Mathematical Induction, Principle of Complete Induction | 1 | 1 |
| 7 | Overview of Sets and Set Operations | 2 | |
| 8 | Permutation and Combination | 1 | |
| 9 | Principle of Inclusion, Exclusion (with proof) and Pigeonhole principle (with proof) | 1 | |
| 10 | Relation, Operation and Representation of a Relation, Equivalence Relation | 2 | 1 |
| 11 | POSET, Hasse Diagrams, extremal Elements | 2 | 1 |
| 12 | Lattices | 2 | 1 |
| 13 | Composition of Function, Inverse, Binary and n-ary Operations | 2 | |
| 14 | Solution Methods for Linear and Non-linear First-Order Recurrence Relations with Constant Coefficients | 3 | 2 |
| AFTER MID TERM | | | |
| 15 | Graph Theory: Terminology | 1 | |
| 16 | Isomorphic Graphs, Euler's Formula (proof) | 1 | |
| 17 | Chromatic Number of a Graph, Five Color Theorem(with proof) | 1 | |
| 18 | Euler & Hamiltonian Paths | 1 | 1 |
| 19 | Groups, Symmetry, Subgroups, Normal Subgroups, Cyclic group, Permutation Group | 3 | 1 |
| 20 | Cayles's Theorem(without proof), Cosets Lagrange's Theorem(with roof) | 2 | 1 |
| 21 | Homomorphism, Isomorphism, Automorphism | 1 | |
| 22 | Rings, Boolean Function, Boolean Expression | 2 | 2 |
| 23 | Representation & Minimization of Boolean Function | 2 | 1 |

Text Books:

[T1] Norman L. Biggs, "Discrete Mathematics", Oxford, second edition.

[T2] Kenneth H. Rosen, "Discrete Mathematics and Its Applications", TMH, seventh edition.

Reference Books:

[R1] Kolman, Busby & Ross, "Discrete Mathematical Structures", PHI, 1996.

[R2] C.L. Liu, "Elements of Discrete Mathematics", TMH, 2000.

[R3] J. P. Trembly & P. Manohar, "Discrete Mathematical Structures with Applications to Computer Science", McGraw Hill, 1997.