**Lesson Plan**

Name of the Faculty : Ms. Sheetal(THEORY)

Discipline : Computer Science and Engineering

Semester : 4th

Subject : **Discrete Mathematics(**PCC-CSE-202G**)**

Lesson Plan Duration : 15 Weeks (from MAY, 2021 to AUG, 2021)

\*\* **Work Load (Lecture/ Practical) per week (in hours):** Lecture-3

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| Week | Theory |
| Lecture day | Topic(Including assignment/test) |
| 1st | 1st | **UNIT-I****Sets, Relation, Function and Propositional Logic:** Operations and Laws of Sets  |
| 2nd | Cartesian Products, Representation of relations |
| 3rd |  Binary Relation, Equivalence Relation, Partial Ordering Relation, POSET, |
| 2nd | 1st | Hasse Diagram, Lattices and its types |
| 2nd |  Function, Bijective functions, Inverse and Composite Function |
| 3rd | Finite and infinite Sets, Countable and Uncountable Sets, |
| 3rd | 1st | Cantor's diagonal argument and The Power Set theorem, **S**chroeder-Bernstein theorem(ASSIGNMENT-1) |
| 2nd | Propositions, Logical operations, Conditional Statements, Tautologies, |
| 3rd | Contradictions, Logical Equivalence, The use of Quantifiers |
| 4th | 1st | **UNIT-II****Basic Counting Techniques and Recurrence Relation:** Pigeon-hole principle  |
| 2nd | Permutation and Combination**,** the Division algorithm: Prime Numbers, |
| 3rd |  The GCD: Euclidean Algorithm |
| 5th | 1st | The Fundamental Theorem of Arithmetic |
| 2nd | Linear recurrence relation with constant coefficients |
|  | 3rd | Homogenous Solutions,  |
| 6th | 1st | Particular Solutions, |
| 2nd | Total Solutions, |
| 3rd | Input-Output Instruction |
| 7th | 1st | Solving recurrence relation using generating functions(ASSIGNMENT-2) |
| 2nd | **Unit-III****Algebraic Structures:** Definitions,  |
| 3rd | Examples of Algebraic Structures with one Binary Operation |
| 8th | 1st | Semi Groups, Monoids |
| 2nd | Groups; Congruence Relation and Quotient Structures, |
| 3rd |  Permutation Groups, Cyclic groups, Normal Subgroups |
| 9th | 1st |  Rings, Integral Domain, |
| 2nd |  Fields; Boolean Algebra and Boolean Ring, |
| 3rd |  Definitions and examples of Algebraic Structures with two Binary Operation(ASSIGNMENT-3) |
| 10th | 1st | Identities of Boolean Algebra, Duality, |
| 2nd | Representation of Boolean Function |
| 3rd | Disjunctive and Conjunctive Normal Form |
| 11th | 1st | **UNIT-IV****Graphs and Trees:** Graphs and their properties |
| 2nd | Degree, Connectivity, Path, Cycle |
| 3rd | Sub Graph, Isomorphism, |
| 12th | 1st | Multigraph and Weighted graph |
| 2nd | Shortest path in Weighted graphs |
| 3rd |  Eulerian paths and circuits |
| 13th  | 1st | Hamiltonian path and circuits |
| 2nd | Planar Graphs, Euler’s formulae, Graph Colouring |
| 3rd | Trees, Binary trees and its traversals |
| 14th  | 1st |  Trees Sorting |
| 2nd |  Spanning tree, Minimal Spanning tree |
| 3rd | Revision of unit-01 |
| 15th | 1st | Revision of unit-02 |
| 2nd | Revision of unit-03 |
| 3rd | Revision of unit-04 |