**PVP SIDDHARTHA INSTITUTE OF TECHNOLOGY PROCESS RECORD FOR ACADEMICS**

**LESSON PLAN**

**(PVPSIT/ACD/01)**

**Academic Year : 2023-24**

## Year/Semester/Section : II B. Tech I SEM/S1

**Branch : Computer Science and Engineering (CSE)**

**Subject Code & Name : 20BS1303- Engineering Mathematics III**

**Name of Faculty : Dr. G. Lalitha Kumari**

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| **COs** | **Course Outcomes** | **Cognitive Level** |
| **CO1** | Understand the fundamental concepts of Discrete Mathematical Structures. | **L2** |
| **CO2** | Apply Normal forms/ Rules of Inference for solving suitable problems. | **L3** |
| **CO3** | Apply the method of Characteristic roots for solving different recurrence relations and make an effective document. | **L3** |
| **CO4** | Analyze various graph techniques to construct a tree. | **L4** |

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| **Unit No.** | **Topic of syllabus to be covered** | Learning out comes | **Lecture/****Tutorial****(L/T)** | **Teaching Mode****(BB/LCD/****OHP/MOOCS)** | Total No. of Hours | **Expected date of Topic to be covered** | **Review/****Remarks****(By HOD)** |
| **I** | **Mathematical Logic:** | Understanding the Course outcomes, CO-PO Mapping and Overview of Syllabus. | 1 | BB/LCD |  |  |  |
| **I** | Statements and notations, connectives | Understanding statements, definitions & symbolic notations and various types of connectives. (**CO1-L2)** | 2 | BB/LCD |  |  |  |
| **I** | Definition of Conjunction and Disjunction and Conditional and Biconditional Problems | Understanding the Definitions, Symbolic notations AND, OR connectives, Implies and implied by and corresponding truth tables, problems.(**CO1- L2)** | 3 | BB/LCD |  |  |  |
| **I** | Well Formed Formulas, Tautologies, Equivalence of formulas, Duality Law |  Understanding Definition of Well Formed Formulas, Tautology and corresponding formulas, Practice the problems based on Equivalence of Formulas.(**CO1- L2)** | 4 | BB/LCD |  |  |  |
| **I** | Tautological Implications, Functionally complete sets of connectives, Other connectives | Solve problems based on Tautological Implications, functionally complete sets, various remaining connectives and problems. (**CO1- L2)** | 6 | BB/LCD |  |  |  |
| **I** | **Normal Forms:** Disjunctive Normal Forms (DNF), Conjunctive Normal Forms (CNF) | Understanding Normal Forms, Understanding different normal forms- DNF, CNF. (**CO1- L2).** | 8 | BB/LCD |  |  |  |
| **I** | Principal of Disjunctive Normal Forms (PDNF), Principal of Conjunctive Normal Forms (PCNF). | Understanding different normal forms-PDNF,PCNF .(**CO1- L2)** | 9 | BB/LCD |  |  |  |
| **I** | **Quiz on UNIT-I** | 10 | BB/LCD |  | **31.08-2023** |  |
| **II** | **Theory of Inference for Statement Calculus** | Explanation about Inference for the statement calculus, Validity using Truth Tables-Rules of Inference – Consistency of Premises. (**CO2- L3)** | 12 | BB/LCD |  |  |  |
| **II** | Inconsistency of Premises | Solving Inconsistency of Premises problems. | 13 | BB/LCD |  |  |  |
| **II** | Conditional proof & Indirect Method Proof. | Introduction to Solving Problems based on condition i, e., additional premise & Indirect Method Proof.(**CO2- L3)** | 14 | BB/LCD |  |  |  |
| **II** | **Predicate calculus,** The Statement Function ,Variables, and Quantifiers | Explaining the basics for Predicate calculus, Explanation of Statement Function, Variable and Quantifier.(**CO2-L3)** | 15 | BB/LCD |  |  |  |
| **II** | Predicate Formulas-Free and Bound Variables | Explaining the rules of Predicate WFF, Free and Bound Variables.(**CO2- L3)** | 16 | BB/LCD |  |  |  |
| **II** | The Universe of discourse | Representation of statements into symbols and related problems.(**CO2-L3)** | 17 | BB/LCD |  |  |  |
| **II** | **Revision on UNIT-II** | 18 | BB/LCD |  | **16-.09-2023** |  |
| **III** | **Recurrence Relations-**  | Understanding the Definition of recurrence relation and formulation of recurrence relations.( **CO1- L2)** | 19 | BB/LCD |  |  |  |
| **III** | Iteration Method for sequences and Recurrence Relation | Understanding the Iteration Method for Generating Sequences. | 20 | BB/LCD |  |  |  |
| **III** | The Method of Characteristic Roots | Solving problems based on Characteristic Roots.( **CO3- L3)** | 22 | BB/LCD |  |  |  |
| **III** | Inhomogeneous Recurrence Relation | Solving In-homogeneous recurrence relations and problems.(**CO3- L3)** | 24 | BB/LCD |  |  |  |
| **III** | Inhomogeneous Recurrence Relation | Solving In-homogeneous recurrence relation problems. (**CO3- L3)** | 26 | BB/LCD |  |  |  |
| **III** | **Revision on UNIT-III** | 27 | BB/LCD |  | **14-.10-2023** |  |
| **IV** | **Relations and Directed Graphs** | Understanding the Definition of relation, directed graphs with examples and problems. (**CO1- L2)** | 28 | BB/LCD |  |  |  |
| **IV** | Special Properties of Binary Relations-  | Understanding Various types and properties of binary relations.(**CO1- L2)** | 29 | BB/LCD |  |  |  |
| **IV** | Equivalence Relations- Ordering Relations | Understanding the definition of equivalence relation and problems, Definition of various ordering relations.(**CO1- L2)**  | 30 | BB/LCD |  |  |  |
| **IV** | Lattices, and Enumerations-  | Definitions, Examples and solving problems on Lattices, Examine about Lattices.(**CO4- L4)** | 31 | BB/LCD |  |  |  |
| **IV** | Operations on Relations | Understanding different operations on relations. (**CO1- L2)** | 32 | BB/LCD |  |  |  |
| **IV** | Paths and Closures- | Understanding the Definitions of path, closure of graphs and examples.(**CO1- L2)** | 33 | BB/LCD |  |  |  |
| **IV** | Directed Graphs and Adjacency Matrices | Definition of digraph and representation of a digraph as an adjacency matrix and solving problems.(**CO4-L4)** | 34 | BB/LCD |  |  |  |
| **IV** | **Revision on UNIT-IV** | 35 | BB/LCD |  | **04-.11-2023** |  |
| **V** | **Graphs – Basic Concepts –**  | Examing the Fundamentals and Definitions on Graphs. (**CO4-L4)** | 36 | BB/LCD |  |  |  |
| **V** | **isomorphism-**sub graphs | Analyzing the problems on Isomorphism Solving problems on sub graphs. (**CO4- L4)** | 37 | BB/LCD |  |  |  |
| **V** | Trees and Their Properties &Spanning Trees | Examining the Properties of Tree, Theorems, Example Problems on Trees.(**CO4-L4) (FLIP CLASS)**Understanding the Algorithm, Theorems in Spanning Trees. Problems on Minimum Spanning Tree and How to calculate cost of Minimum Spanning Tree.(**CO1- L2)** | 38 | BB/LCD |  |  |  |
| **V** | Spanning Trees  | More Problems on Minimum Spanning Tree and How to calculate cost of Minimum Spanning Tree.(**CO1- L2)** | 39 | BB/LCD |  |  |  |
| **V** | **Planar Graphs,** Euler Graphs | Understanding the Definition, Problems on Planar Graphs. (**CO1- L2),**  Introduction, Problems on Euler Graphs.(**CO1- L2)** | 41 | BB/LCD |  |  |  |
| **V** | Multigraphs , Euler Circuits, Example Problems | Understanding Multigraphs and the Theorems, Applications, and Example problems.(**CO1- L2).**Examining Euler Circuits and the Theorems, Applications, and problems on Euler Circuits.(**CO4-L4)** | 42 | BB/LCD |  |  |  |
| **V** | Introduction - Hamiltonian Graphs, Rules for Hamiltonian Graphs | Examining Hamiltonian Graphs. **(**C**O4- L4).**Rules for constructing paths and Circuits, Theorems, Example problems on Hamiltonian Graphs.(**CO4-L4)** | 43 | BB/LCD |  |  |  |
| **V** | Problems on Hamiltonian Graphs , Chromatic Numbers | Exercise problems on Hamiltonian Graphs (**CO4-L4).** Understanding the Rules for Chromatic number, Theorems, Example problems (**CO1-L2)**  | 44 | BB/LCD |  |  |  |
| **V** | **Revision on UNIT-V** |  | 45 | BB/LCD |  | **25-.11-2023** |  |

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 **Legend**: Teaching Mode

 **BB**: Black Board / LCD: Power Point Presentation/MOOCS: Massive Open Online Courses

 **Signature of the Faculty Signature of the HOD**

 **Dr G Lalitha Kumari**