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|-----------------------------|---|--|
| Name of Faculty | : | Faculty of Computer Science & Applications |
| Name of Program | : | Bachelor of Computer Application with Industry Collaboration |
| Course Code | : | 1BBM01 |
| Course Title | : | Basis of Mathematics |
| Type of Course | : | Basic Science |
| Year of Introduction | : | 2023-24 |

| | | |
|-------------------------|------|---|
| Prerequisite | : | - |
| Course Objective | : | To understand the rate of change, convergence, divergence, Cartesian, and polar system. |
| Course Outcomes | : | At the end of this course, students will be able to: |
| | CO 1 | Understand the matrix use to solve any linear system of equations |
| | CO 2 | Understand different techniques to solve first order difference equation and behaviour of the student at future time. |
| | CO 3 | Understand the various and appropriate test for convergence of the sequence and series |
| | CO 4 | Understand how the improper integration can be solved |
| | CO 5 | Understand how area and volume can be find by double and triple integration |

Teaching and Examination Scheme

| Teaching Scheme (Contact Hours) | | | Credits | Examination Marks | | | | |
|---------------------------------|-----|-----|---------|-------------------|--------------|---|-----------------|-----|
| L | T | P | | C | Theory Marks | | Practical Marks | |
| SEE | CIA | SEE | CIA | | | | | |
| 4 | 0 | 0 | 4 | 100 | 50 | 0 | 0 | 150 |

Legends: L-Lecture; T-Tutorial/Teacher Guided Theory Practice; P-Practical, C - Credit, SEE - Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.))

Course Content

| Unit No. | Topics | Teaching Hours | Weightage | Mapping with CO |
|----------|---|----------------|-----------|-----------------|
| 1 | Matrices: Concept of Matrix, Types of Matrices, Addition, Subtraction and multiplication by scalar of matrices, Product of two matrices Adjoint, Inverse and Rank of matrices. | 15 | 25% | CO 1 |
| 2 | Set Theory: Basic concept of set theory: Definition, Equality of set, Cartesian product, The power set, some operation of set, Venn diagram, Some basic set identities. | 15 | 20% | CO 2 |

| | | | | |
|---|--|----|-----|------|
| 3 | Boolean algebra: Definition of Boolean algebra as algebraic structures with two operations basic results truth values and truth tables, laws, and theorems of Boolean algebra, De-Morgan's theorem. | 15 | 25% | CO 3 |
| 4 | Graphs: Graphs terminology, Representing Graphs, Directed and undirected graphs and their matrix representations, Trees: Definition of trees, Branch nodes, leaf nodes, root, Examples: Representation of tree Examples: binary tree, m-ary tree and complete binary tree. | 15 | 30% | CO 4 |

| Suggested Distribution of Theory Marks Using Bloom's Taxonomy | | | | | | |
|---|-------------|---------------|-------------|---------|----------|--------|
| Level | Remembrance | Understanding | Application | Analyse | Evaluate | Create |
| Weightage | 40 | 40 | 20 | - | - | - |

NOTE: This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Suggested List of Experiments/Tutorials

| Sr. No. | Name of Experiment/Tutorial | Teaching Hours |
|---------|--|----------------|
| 1 | Echelon and row Echelons | 2 |
| 2 | Rank of the matrix and solution of system of linear equation | 2 |
| 3 | Solution of Ordinary Differential equation | 2 |
| 4 | Exact and Non Exact differential equation | 2 |
| 5 | Convergence and divergence of sequence and series | 2 |
| 6 | Power series | 2 |
| 7 | Convergence and Divergence of improper integration | 2 |
| 8 | Beta and Gamma Functions | 2 |
| 9 | Algebraic structure | 2 |
| 10 | Truth values and truth table | 2 |

Suggested Learning Websites

| Sr. No. | Name of Website |
|---------|---|
| 1 | https://semesters.in/engineering-mathematics-for-btech-first-year/ |
| 2 | https://www.nptel.ac.in |
| 3 | https://tutorial.math.lamar.edu/classes/calci/calci.aspx |
| 4 | https://www.khanacademy.com |

Reference Books

| Sr. No. | Name of Reference Books |
|---------|--|
| 1 | Erwin Kreyszig, <i>Advanced Engineering mathematics</i> , John Wiley, 10th Ed., 2015. |
| 2 | B. S Grewal, <i>Higher Engineering Mathematics</i> , (43rd Edition), Khanna Pub., Delhi (2014). |
| 3 | B V Ramana, <i>Higher Engineering Mathematics</i> ; McGraw-Hill |
| 4 | D C Lay, <i>Linear Algebra and its Application</i> ; Pearson Publication |
| 5 | <i>Mathematics 1</i> By Dr R C Shah |
| 6 | R. K. Jain and S. R. K. Iyernagar, <i>Advanced Engineering Mathematics</i> , Alpha Science, 3rd Ed., 2007. |
| 7 | <i>Discrete Mathematics</i> By Dr Purnima P. Patwardhan, Technical publication. |