# SAGE University, Indore

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| **Institute Name: Institute of Computer Application** | | | | | | |
| **Recommended Programs : BCA** | | | | | **Semester : I** | |
| **Course Name** | Theory of Mathematics | | **Course Code** | | CAPDCTOM001T | |
| **Credit Score** | **L** | **T/M** | **P** | **N** | **Total Credits** | **4** |
| **3** | **1** | **0** | **0** |
| **Prerequisites** | Mathematics of 11th 12th class (041), NCERT, MP Board | | | | | |
| **Course Objectives** | The purpose of offering this course are:   1. To develop the skills in the areas of Matrices, Sets, relations and functions, Differentiation and Integration. 2. Mathematics concepts serves as a pre-requisite for post graduate courses, specialized studies and research. | | | | | |
| **Course Content** | **Unit I: Sets, relations and functions**  Definition of Set, Type of Sets, Operations on Sets, Venn diagram, Cartesian Product, Relations, Functions, Types of function, Some elementary functions with their graphs (Exponential, logarithmic, modulus), Limit & continuity of a function (Simple Problems).  **Number of Lectures required: 10**  **Unit II: Matrices**  Types of Matrices, Operations of addition, Scalar Multiplication and Multiplication of Matrices, Determinant of a Square Matrix, Minors and Cofactors, Transpose, adjoint and inverse of a matrix, solving system of linear equations, in two or three variables using inverse of a matrix.  **Number of Lectures required: 10**  **Unit III: Differentiation and Integration**  Derivative and its meaning, Differentiation of algebraic, trigonometric, exponential & logarithmic functions, Rules of Differentiation, Differentiation by Substitution, Higher Order Differentiation, Maxima and Minima of Simple Functions, definite and indefinite integral, application of calculus in computer science.  **Number of Lectures required: 10**  **Unit IV: Coordinate Geometry**  2D Cartesian Co-ordinate system, Straight line: (Equation & Slope of a line), Circle: Equation of Circle, Equation to Tangent, Conic Sections: Focus, Eccentricity, Directrix, Axis of a conic section, Parabola & Ellipse: (Definitions, equations and shape of curve only)  **Number of Lectures required: 9**  **Unit V: Statistics and Probability**  Introduction, definition, terminologies in statistics and probability, measure of central tendency and dispersion, probability distribution – continuous and discrete, Bayes theorem, testing of hypothesis, basics of ANOVA, Correlation and Regression Analysis.  **Number of Lectures required: 9** | | | | | |
| **Text Books** | 1. Mathematics for BCA by G. C. Sharma &Madhu Jain, Oscar Publication 2. Mathematics Vol-2 by R. D. Sharma, Dhalpat Raj & Sons. | | | | | |
| **References** | 1. The Elements of Co-ordinate Geometry Part-I by S. L. Loney, Book Palace, New Delhi. | | | | | |
| **Course Outcomes** | After completion of the course the student will be able:   1. To know and define the use of basic concepts of Matrices. 2. To apply the concept of set relation and functions in functions. 3. To know the methods and rules of calculus. 4. To understand the basics2D Cartesian Co-ordinate system, Straight line. 5. To know the basics of statistics and probability for computer science. | | | | | |

**Mapping of Course outcome with Program Outcomes, PSO’s, and Knowledge Levels (As per Blooms Taxonomy)**

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| **CO/PO** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **Knowledge Levels (K1, K2, …, K6)** |
| **CO1** | 3 | 2 |  |  |  | 1 |  |  | 1 |  | 1 | 2 | 2 | 1 |  | 2 | K2 |
| **CO2** | 3 | 2 | 3 |  |  | 1 |  |  | 1 |  | 1 | 2 | 2 | 1 |  | 2 | K3 |
| **CO3** | 3 | 2 | 3 | 3 |  | 1 |  |  | 1 |  | 1 | 2 | 2 | 1 | 1 | 2 | K3 |
| **CO4** | 3 | 2 | 3 | 2 |  | 1 |  |  | 1 |  | 1 | 2 | 2 | 2 | 1 | 2 | K5 |
| **CO5** | 3 | 2 | 3 | 3 | 3 | 1 |  |  | 1 |  | 1 | 2 | 2 | 2 | 1 | 2 | K6 |

**High-3 Medium-2 Low-1**

**K1 =>Remember K2 =>Understand K3 =>Apply K4 =>Analyze K5 =>Evaluate K6 =>Create**

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| Designed By:  **(Name with Sign.)** | Checked By:  **(Name with Sign.)** | Approved By:  **(Name with Sign.)** |