# ALLIED MATHEMATICS I and II FOR COMPUTER SCIENCE and BCA

**SEMESTER I - MATHEMATICAL STRUCTURES FOR COMPUTER SCIENCE**

**Subject Description:** This subject deals with mathematical concepts like Matrices, Numerical analysis and Statistical methods for computer science and applications.

**Goal:** To learn about the mathematical structures for computer based applications

**Objective:** On successful completion of this subject the students should have

* Understood the concepts of mathematics
* Learnt applications of statistical and numerical methods for Computer Science.

**UNIT I:** Matrices – Introduction – Determinants – Inverse of a matrix – Rank of a Matrix.

**UNIT II:** System of Simultaneous Linear algebraic Equation – Gauss elimination, Gauss Jordon, Gauss Seidal methods.

**UNIT III:** Numerical Differentiations – Newton‘s forward Difference - Backward Difference – Stirling’s formula - Numerical Integration – Trapezoidal Rule & Simpson‘s rule.

**UNIT IV:** Measures of central tendency – Mean Median and Mode – Relationship among mean median and mode. Measures of dispersion – Range and Standard deviation.

**UNIT V:** Correlation andRegression - Correlation – Coefficient of correlation – Linear regression –– Regression equations.

# TEXT BOOKS:

1. Engineering Mathematics, Volume II, Dr M.K. Venkataraman, National Publishing Company, Chennai. (Unit I)
2. Numerical Methods in Science & Engineering, M.K. Venkataraman, National Publishing Company, Chennai, Revised Edition -2005 (Unit II & III)
3. Business Statistics, S.P. Gupta & M.P. Gupta, Sultan Chand and Sons (Unit IV & V)

# REFERENCE BOOKS:

1. Numerical Methods, E. Balagurusamy, Tata McGraw Hill.
2. Fundamental of Mathematical Statistics, S. C. Gupta, V. K. Kapoor, Sultan Chand & Sons

# SEMESTER II - DISCRETE MATHEMATICS

**Subject Description:** This subject deals with discrete structures like set theory, mathematical logic, relations, languages, graphs and trees.

**Goal:** To learn about the discrete structures for computer based applications.

**Objective:** On successful completion of this subject the students should have: - Understanding the concepts of discrete mathematics - Learning applications of discrete structures in Computer Science.

**UNIT I:** Set theory-Introduction-Set & its Elements-Set Description-Types of sets-Venn- Euler Diagrams- Set operations & Laws of set theory

**UNIT II:** Mathematical logic – Introduction- prepositional calculus –Basic logical operations- Tautologies-Contradiction-Argument-Method of proof- Predicate calculus.

**UNIT III:** Relations – Binary Relations – Set operation on relations-Types of Relations – Partial order relation – Equivalence relation – Composition of relations

**UNIT IV:** Languages – Operations on languages – Regular Expressions and regular languages – Grammar – Types of grammars.

**UNIT V:** Graph Theory – Basic terminology – paths, cycle & Connectivity – Sub graphs – Types of graphs – Representation of graphs in computer memory.

# TEXT BOOKS:

1. Discrete Mathematics, J.K. Sharma, 2nd edition, 2005, Macmillan India Ltd. (UNIT I TO V)

# REFERENCE BOOKS:

1. Discrete Mathematics Structures with Applications to Computer Science, J. P. Tremblay, R Manohar, McGraw Hill International Edition
2. Discrete Mathematics, M. K. Venkataraman, N.Sridharan, N.Chandarasekaran, National Publishing Company, Chennai