

Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal, M.P.

Bridge Course of Computer in MCA w.e.f.

SUBJECT- Basic Computer Knowledge

Unit 1: Introduction to Computers Basic Concepts: Definition and types of computers (analog, digital, hybrid), Evolution of computers: from abacus to modern computers, Number systems: Decimal, binary, octal, hexadecimal Conversion between number systems

Unit 2: Component of a Computer system: hardware and software Hardware Components: Input devices (keyboard, mouse, scanner, etc.) Output devices (monitor, printer, plotter, etc.) Storage devices (primary and secondary storage) Central Processing Unit (CPU): control unit, arithmetic logic unit, and registers Software Components:

Unit 3: System software: operating systems (Windows, Linux, macOS), device drivers, utilities Application software: word processors, spreadsheets, presentation software, database management systems, programming languages

Unit 4: Computer Networks Introduction to Computer Networks: Definition and types of networks, Internet and World Wide Web: Basics of the Internet: how it works, Internet Service Providers (ISPs) Using web browsers: surfing the web, searching for information, using email Understanding URLs and domain names E-commerce and online transactions

Unit 5: Programming Fundamentals Introduction to programming languages: Low-level vs. high-level languages, Compilers and interpreters, Algorithm and flowchart concepts: Definition, symbols, and examples Problem-solving and algorithm design, Basic programming concepts: variables, data types, operators, control flow statements (if-else, loops)

Reference Books:

1. Computers Today by D.H. Sanders and S.K. Basandra
2. "Computer Fundamentals" by P.K. Sinha and Priti Sinha
3. "Fundamentals of Computers" by V. Rajaraman
4. Computer Networking: A Top-Down Approach by James F. Kurose and Keith W. Ross
5. Let Us C by Yashavant Kanetkar (for programming Fundamentals)



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Bridge Course of Mathematics in MCA w.e.f.

MATHEMATICS BRIDGE COURSE SYLLABUS

- 1. Matrices :** Concept, notation, order, equality, types of matrices, zero and Identity matrix, transpose of a matrix, symmetric and skew symmetric matrices. Operation on matrices: Addition and multiplication and multiplication with a scalar. Simple properties of addition, multiplication and scalar multiplication. On commutativity of multiplication of matrices and existence of non-zero matrices whose product is the zero matrix (restrict to square matrices of order 2). Concept of elementary row and column operations. Invertible matrices and proof of the uniqueness of Inverse, If it exists; (Here all matrices will have real entries).
- 2. Determinants :** Determinant of a square matrix (up to 3×3 matrices), properties of determinants, minors, co-factors and applications of determinants in finding the area of a triangle. Adjoint and Inverse of a square matrix. Consistency, Inconsistency and number of solutions of system of linear equations by examples, solving system of linear equations in two or three variables (having unique solution) using Inverse of a matrix.
- 3. Straight Lines :** Brief recall of two dimensional geometry from earlier classes. Shifting of origin. Slope of a line and angle between two lines. Various forms of equations of a line: parallel to axis, point-slope form, slope-intercept form, two-point form, Intercept form and normal form. General equation of a line. Equation of family of lines passing through the point of Intersection of two lines. Distance of a point from a line.
- 4. Conic Sections :** Sections of a cone: circles, ellipse, parabola, hyperbola, a point, a straight line and a pair of intersecting lines as a degenerated case of a conic section. Standard equations and simple properties of parabola, ellipse and hyperbola. Standard equation of a circle.
- 5. Introduction to Three-dimensional Geometry :** Coordinate axes and coordinate planes in three dimensions. Coordinates of a point. Distance between two points and section formula.

Reference Books:

1. NCERT Maths Books
2. Mathematics for Class 12th Vol. 1 & Vol. 2 by R D Sharma
3. Senior Secondary School Maths. 12th by R S Agarwal

