

**C.C.S. University, Meerut.**  
**Bachelors of Computer Application**  
**Semester - wise**

**SEMESTER -V**

<b>Course Code</b>	<b>Course Name</b>
BCA-501	Introduction to DBMS
BCA-502	Java Programming and Dynamic Webpage Design
BCA-503	Computer Network
BCA-504	Numerical Methods
BCA-508	Minor Project
BCA-507	Viva-Voice on Summer Training
BCA-505	Computer Laboratory and Practical Work of DBMS
BCA-506	Computer Laboratory and Practical Work of Java Programming & Dynamic Webpage Design

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<b><u>BCA-501</u></b>	<b><u>Introduction to DBMS</u></b>

### **UNIT-I**

**Introduction:** Characteristics of database approach, data models, DBMS architecture and data independence.

### **UNIT-II**

**E-R Modeling:** Entity types, Entity set, attribute and key, relationships, relation types, roles and structural constraints, weak entities, enhanced E-R and object modeling, Sub classes; Super classes, inheritance, specialization and generalization.

### **UNIT-III**

**File Organization:** Indexed sequential access files; implementation using B & B++ trees, hashing, hashing functions, collision resolution, extendible hashing, dynamic hashing approach implementation and performance.

### **UNIT-IV**

**Relational Data Model:** Relational model concepts, relational constraints, relational algebra  
**SQL:** SQL queries, programming using SQL.

### **UNIT-V**

**EER and ER to relational mapping:** Data base design using EER to relational language.

### **UNIT-VI**

**Data Normalization:** Functional Dependencies, Normal form up to 3<sup>rd</sup> normal form.

**Concurrency Control:** Transaction processing, locking techniques and associated, database recovery, security and authorization. Recovery Techniques, Database Security

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**BCA- 502**      **Java Programming and Dynamic Webpage Design**

### **UNIT-I**

**Java Programming:** Data types, control structured, arrays, strings, and vector, classes (inheritance, package, exception handling) multithreaded programming.

### **UNIT-II**

Java applets, AWT controls (Button, Labels, Combo box, list and other Listeners, menu bar) layout manager, string handling (only main functions)

### **UNIT-III**

Networking (datagram      socket and TCP/IP based server socket) event handling,  
JDBC:

Introduction, Drivers, Establishing Connection, Connection Pooling.

### **UNIT-IV**

HTML: use of commenting, headers, text styling, images, formatting text with <FONT>, special characters, horizontal rules, line breaks, table, forms, image maps, <META> tags, <FRAMESET> tags, file formats including image formats.

### **UNIT-V**

**Java Servlets:** Introduction, HTTP Servlet Basics, The Servlet Lifecycle, Retrieving Information, Sending HTML Information, Session Tracking, Database Connectivity

### **UNIT-VI**

**Java Server Pages:** Introducing Java Server Pages, JSP Overview, Setting Up the JSP Environment, Generating Dynamic Content, Using Custom Tag Libraries and the JSP Standard Tag Library, Processing Input and Output



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**BCA-503**          **Computer Network**

### **UNIT-I**

**Basic Concepts:** Components of data communication, distributed processing, standards and organizations. Line configuration, topology, Transmission mode, and categories of networks.

**OSI and TCP/IP Models:** Layers and their functions, comparison of models.

Digital Transmission: Interfaces and Modems: DTE-DCE Interface, Modems, Cable modems.

### **UNIT-II**

**Transmission Media:** Guided and unguided, Attenuation, distortion, noise, throughput, propagation speed and time, wavelength, Shannon capacity, comparison of media

### **UNIT-III**

**Telephony:** Multiplexing, error detection and correction: Many to one, One to many, WDM, TDM, FDM, Circuit switching, packet switching and message switching.

Data link control protocols: Line discipline, flow control, error control, synchronous and asynchronous protocols, character and bit oriented protocols, Link access procedures.

**Point to point controls:** Transmission states, PPP layers, LCP, Authentication, NCP. **ISDN:** Services, Historical outline, subscriber's access, ISDN Layers and broadcast ISDN. **UNIT-IV**

**Devices:** Repeaters, bridges, gateways, routers, The Network Layer; Design issues, Routing algorithms, Congestion control Algorithms, Quality of service, Internetworking, Network-Layer in the internet.

### **UNIT-V**

**Transport and upper layers in OSI Model:** Transport layer functions, connection management, functions of session layers, presentation layer and application layer.

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**BCA-504**      **Numerical Methods**

**UNIT-I**

**Roots of Equations:** Bisections Method, False Position Method, Newton's Raphson Method, Rate of convergence of Newton's method.

**UNIT-II**

**Interpolation and Extrapolation :** Finite Differences, The operator E, Newton's Forward and Backward Differences, Newton's dividend differences formulae, Lagrange's Interpolation formula for unequal Intervals, Gauss's Interpolation formula, Starling formula, Bessel's formula, Laplace-Everett formula.

**UNIT-III**

**Numerical Differentiation Numerical Integration :** Introduction, direct methods, maxima and minima of a tabulated function, General Quadratic formula, Trapezoidal rule, Simpson's One third rule, Simpson's three- eight rule.

**UNIT-IV**

**Solution of Linear Equation:** Gauss's Elimination method and Gauss's Siedel iterative method.

**UNIT-V**

**Solution of Differential Equations:** Euler's method, Picard's method, Fourth-order Runga – Kutta method.