



# Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

## Shri Vaishnav Institute of Computer Applications

Name of Program: BCA + MCA (Banking Technology)

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BCCA601	Compulsory	Advanced Java	3	1	0	4	60	20	20	0	0

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

Q/A – Quiz/Assignment/Attendance, MST - Mid Sem Test.

\***Teacher Assessment** shall be based on following components: Quiz/Assignment/Project/Participation in class (Given that no component shall exceed 10 Marks)

### Course Education Objectives (CEOs):

This course covers the implementation of advanced program designs with the tools available in the Java programming language. After a detailed review of the fundamentals, advanced topics will include the Graphical User Interface (GUI) for applications, 2D graphics, multimedia, multithreading and client-server models for networking and database connectivity. If time and interest permits, the class may introduce the Java tools for generics and collections.

### Course Outcomes (COs):

Students will build on their understanding of Object-Oriented Design (OOD) and Programming (OOP) in Java and learn to write robust, Graphical User Interface (GUI) applications and applets. Students will gain a practical familiarity with 2D graphics, multimedia, programming for concurrency, networking and database connectivity. Students may investigate programming for Web Services, if time and interest permits.

### Syllabus:

#### UNIT – I

Java Networking: Network Basics and Socket overview, TCP/IP client sockets, URL, TCP/IP server sockets, Datagrams, java.net package Socket, ServerSocket, InetAddress, URL, URL Connection.

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BCCA601	Compulsory	Advanced Java	3	1	0	4	60	20	20	0	0

JDBC Programming: The JDBC Connectivity Model, Database Programming: Connecting to the Database, Creating a SQL Query, Getting the Results, Updating Database Data, Error Checking and the SQLException Class, Statement Interface, PreparedStatement, CallableStatement, ResultSet Interface, Updatable Result Sets, JDBC Types, Executing SQL Queries, Executing SQL Updates.

## UNIT - II

Servlet API and Overview: Servlet Model: Overview of Servlet, Servlet Life Cycle, HTTP Methods Structure and Deployment descriptor ServletContext and ServletConfig interface, Attributes in Servlet, Request Dispatcher interface The Filter API: Filter, FilterChain, Filter Config Cookies and Session Management: Understanding state and session, Understanding Session Timeout and Session Tracking, URL Rewriting.

## UNIT – III

Java Server Pages: JSP Overview: The Problem with Servlets, Life Cycle of JSP Page, JSP Processing, JSP Application Design with MVC, JSP Directives, JSP Action, JSP Implicit Objects, JSP Form Processing, JSP Session and Cookies Handling, JSP Session Tracking JSP Database Access, JSP Standard Tag Libraries, JSP Custom Tag, JSP Expression Language, JSP Exception Handling, JSP XML Processing.

## UNIT – IV

Java Server Faces2.0: Introduction to JSF, JSF request processing Life cycle, JSF Expression Language, JSF Standard Component, JSF Facelets Tag, JSF Converter Tag, JSF Validation Tag, JSF Event Handling and Database Access.

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### UNIT – V

Hibernate4.0: Overview of Hibernate, Hibernate Architecture, Hibernate Mapping Types, Hibernate O/R Mapping, Hibernate Annotation.

Java Web Frameworks: Spring MVC: Overview of Spring, Spring Architecture, bean life cycle, XML Configuration on Spring, Aspect – oriented Spring, Managing Database, Managing Transaction

### Text Books:

1. Patrick Naughton and HerbertzSchildt, “Java-2: The Complete Reference”, TMH, 5<sup>th</sup> edition, 2002.
2. Jim Keogh, “J2EE: The complete Reference”, McGraw-Hill Education (India) Pvt Limited, 2002.
3. Rick Darnell, “HTML 4 unleashed”, Techmedia Publication, 2000
4. Shelley Powers, “Dynamic Web Publishing”, 2<sup>nd</sup> edition, Techmedia, 1998.
5. Paul Dietel and Harvey Deitel, “Java How to Program”, PHI, 8<sup>th</sup> edition, 2010.

### Reference Books:

1. E. Balagurusamy, “Programming with Java: A Primer”, TMH, 1998.
2. Horstmann, “Computing Concepts with Java 2 Essentials”, John Wiley.
3. Decker and Hirshfield, “Programming Java: A Introduction to Programming Using JAVA”, Vikas Publication, 2000.
4. N.P. Gopalan and J. Akilandeswari, “Web Technology- A Developer’s Perspective”, PHI, 2<sup>nd</sup> edition
5. Eric Jendrock, Jennifer Ball, Debbi Carson, “The Java EE5 Tutorial”, Pearson, 3<sup>rd</sup> edition, 2007.
6. Daniel Liang, “Introduction to Java Programming”, Pearson, 7<sup>th</sup> edition, 2010.

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BCBT604	Compulsory	Smart Banking Technologies and payment systems	3	1	0	4	60	20	20	0	0

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### Course Educational Objectives (CEOs):

- To familiarize the students with the need and scope of the subject to build the mental makeup of the students for the field of smart banking
- Using simple and well drawn illustrations develop students skills to use the new banking technologies.
- To make the students well versed with the latest trends and developments in banking technology.

**Course Outcomes (Cos):** The student will be able to

- Have a good knowledge of the fundamental concepts that provide the foundation of smart banking systems.
- Understand the basic principles, concepts and applications of banking specially smart banking.
- Introduce the task of E-Banking in Indian and Global context.
- Ability to do Conceptual, Logical and Physical design of smart banking products, applications and their deployment
- Understand and apply the security measures in E banking.
- Understand the process of system audit and recovery and disaster management.
- Explore the subject to start as a researcher

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### Unit-I

Banking Technology, Smart Banking: Introduction, Smart Banking environments- Characteristics, Components and Technologies, Technology Distribution Channels. Teller machines at the bank counters, Cash Dispensers, ATMs, Anywhere Any Time banking, home banking, (corporate and personal), electronic payment systems, Issues in Smart Banking

### Unit-II

RFID: Introduction, Components of RFID system, Operating frequency, RFID security considerations, RFID Applications – Short range RFID applications, Long range RFID applications.

Online banking, Online enquiry and update facility, personal identification numbers and their use in consumption with magnetic cards of both credit and debit cards, smart cards, Smart cards with different couplings, signature storage and display by electronic means.

### Unit-III

Software Agents: Introduction, Fundamentals, Agents as Tools of the Information Society, Fundamental Concepts of Intelligent Software Agents, Base Modules of Agent Systems, Development Methods and Tools, Application Areas for Intelligent Software Agents

### Unit-IV

Electronic fund transfer systems, plain messages (telex or data communication), structured messages (SWIFT etc.), RTGS, Information Technology, Current Trends, Banknet, RBI net, Datanet and Nienet, I-net, Internet, E-mail etc.

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### Unit-V

Computerized accounting in electronic environment- methods, procedures, security, rectification. Core banking environment, maintaining different accounts electronically. Global developments in banking technology, IT in finance and service delivery. Impact of technology on banks, System Audit. Audit measures in computerized environment.

### Text Books:

1. Intelligent Software Agents: Foundations and Applications, Walter Brenner, Rudiger Zarnekow, Hartmut Wittig, springer verlag 1998.
2. RFID, Steven Shepard, Mc Graw Hill 2004.
3. Context-Aware Pervasive Systems: Architectures for a New Breed of Applications, Seng Loke, Auerbach, 2006.

### Reference Books:

1. Agent Technology Handbook, Dimitris N. Chorafas, Mc Graw Hill 1997.
2. RFID Implementation, Dennis Brown, Mc Graw Hill Osborne Media, 2006.
3. Fast and Efficient Context-Aware Services (Wiley Series on Communications Networking & Distributed Systems) Danny Raz, Arto Tapani Juhola, Joan Serrat Fernandez, Alex Galis.

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BCCA603	Compulsory	Software Engineering	3	1	0	4	60	20	20	0	0

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### Course Education Objectives (CEOs):

- To provide knowledge about system development.
- To impart knowledge about software process models.
- To provide detailed knowledge about software design.
- To acquaint students with software quality and testing.

**Course Outcomes (COs):** Students will be having:

- An ability to understand system design and its constraints.
- An ability to apply knowledge of software engineering.
- An ability to design a system, a component or process to meet desired needs.
- An ability to identify, formulate and solve engineering Problems
- An ability to measure and to understand quality issues.

### Syllabus:

#### UNIT- I

Introduction: Definition of software and software engineering, Software myths, Software Engineering paradigms: Linear Sequential Model and Prototyping Model. Software Project Management, Software Metrics, Software Cost Estimation, Software Project Planning.

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BCCA603	Compulsory	Software Engineering	3	1	0	4	60	20	20	0	0

### UNIT -II

Software Requirement Analysis: Software Risks, Software Configuration Management, System Analysis, Modeling the System Architecture, System Specification, Fundamentals

of Requirement Analysis, Software Prototyping, Prototyping methods and tools specification  
Software requirements Specifications

### UNIT -III

Structured Analysis: Introduction, elements of Analysis model, data objects, attributes and relationships, Cardinality and Modality, ERD, DFD. Classical Analysis Methods: DSSD, JSD, SADT.

### UNIT- IV

Software Design: Design principles: Problem partitioning and hierarchy, Abstraction, Modularity, Top-down and Bottom-up strategies. Effective Modular design: functional independency, Cohesion and Coupling.

### UNIT- V

Software Testing Methods: Software Testing Fundamentals, White Box Testing, Black Box Testing, Debugging, Software Quality: McCall's Quality Factors.

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BCCA603	Compulsory	Software Engineering	3	1	0	4	60	20	20	0	0

### Text Books:

1. Roger S. Pressman, Software Engineering – A Practitioner's Approach, McGraw Hill, 7<sup>th</sup> Edition.
2. Pankaj Jalote, An Integrated Approach to Software Engineering, Third Edition.

### Reference Books:

1. Richard Fairley, Software Engineering – Design Reliability and Management.
2. Sommerville, Software Engineering, Pearson Education, 7<sup>th</sup> Edition.
3. Elias M. Awad, "System Analysis & Design", Galgotia publications.

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BCBT605	Compulsory	Introduction to Cyber Security	3	1	0	4	60	20	20	0	0

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\***Teacher Assessment** shall be based on following components: Quiz/Assignment/Project/Participation in class (Given that no component shall exceed 10 Marks)

### Course Education Objectives (CEOs):

1. To provide the detailed knowledge of security and to protect your organization against cyber threats.
2. To familiarize with the Network and Mobile security, IOT, Cloud security and Security Intelligence and SOC.

### Course Outcomes (COs):

1. Understanding steps you can take to protect your organization against cyber threats and exploring.
2. Analyze the working mechanism of tools used by penetration testers and ethical hackers (network CLI tools, Telnet, SSH, Nmap, Wireshark, and many others).

### Syllabus:

#### UNIT – I

**Cybercrime:** Introduction, motive of attackers, active attacks, passive attacks, Software attacks, hardware attacks, Conventional crime VS cybercrime, classification of cybercrime, factors responsible for cybercrime.

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BCBT605	Compulsory	Introduction to Cyber Security	3	1	0	4	60	20	20	0	0

**Impact of cyber security threats in current scenario:** Research global cyber security trends in different geographies, Explore the enterprise cyber security domains, Explore the most frequently targeted industry sectors including: Government, Energy and Utilities, cyber resilience framework and cyber resilience lifecycle.

## UNIT – II

**Cyber-threat hunting approach and its Need:** Explore cyber-attack adversary frameworks, Investigate enterprise threat protection methods, Explore industry case studies, Understand how cyber criminals use networks in the dark web to perform illicit crime activities, Learn network protection practices like DNS, VPN.

**Mobile and IOT Security: Explore the mobile and IoT global phenomena:** Understand mobile and IoT attack surface, Explore recent most threatening IoT cyber-attack scenarios.

## UNIT – III

**Concept of wide adoption of industry applications:** Learn web application fundamentals, investigate application security practices, Examine the anatomy of the most dangerous applications threats, Understand the impact of data breaches and ransomware in Government and Health sectors: Research the anatomy and impact of Insider Threat and Phishing cyber-attacks, Research the anatomy and impact of Ransomware and Cyber Fraud cyber-attacks.

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BCBT605	Compulsory	Introduction to Cyber Security	3	1	0	4	60	20	20	0	0

### UNIT – IV

**Global enterprise adoption of cloud computing:** Understand the cloud security challenges brought by an integrated data, network, access infrastructure, Review the key cloud security practices for the enterprise, Explore a Telco cloud data breach scenario.

### UNIT – V

**Roles of drivers behind the enterprise adoption of Security Intelligence methods and tools:**

Explore the characteristics of Security Information and Event Management (SIEM) platforms, Understand the Incident Response and Threat hunting practice: Explore the benefits of establishing a SOC (Security Operation Center), understand the roles and responsibilities of SOC Operations team.

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BCBT605	Compulsory	Introduction to Cyber Security	3	1	0	4	60	20	20	0	0

### Text Books:

1. Nina Godbole and Sunit Belpure, Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal perspectives, Wiley.
2. IBM Corporation, "Cyber Security Practitioner", IBM, 2020.
3. B.B.Gupta, D.P.Agrawal, Haoxiang Wang, Computer and Cyber Security: Principles, Algorithm, Applications, and Perspectives, CRC Press, ISBN 780815371335, 2018.

### Reference Books:

1. Cyber Security Essentials, James Graham, Richard Howard and Ryan Otson, CRC Press.
2. Introduction to Cyber Security, Chwan-Hwa (John) Wu, J. David Irwin, CRC Press T&F Group.
3. IBM Corporation, "IBM QRadar SIEM Foundations", IBM, 2017.

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BCCA615	Elective	Advanced DBMS	4	0	0	4	60	20	20	0	0

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### Course Educational Objectives (CEOs):

- To familiarize the students with the need and scope of the subject.
- to prepare the students so that they can handle the data needed for different organizations
- To develop better understanding of the recent advancements in the field of Database Management System.
- Using simple and well drawn illustrations to develop students skills for data storage and retrieval to support the decision making process.

### Course Outcomes (COs): The student will be able to

- understand the different issues involved in the design and implementation of a database system.
- understand and use the concepts of database designs and database models to solve real world problems
- develop an understanding of essential DBMS concepts such as: database security, integrity, concurrency, distributed database and intelligent database, Client/Server etc.
- apply the concepts of transaction processing for safe and secure transactions in different scenarios
- design and demonstrate the different kind of databases and use backup and recovery provisions

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BCCA615	Elective	Advanced DBMS	4	0	0	4	60	20	20	0	0

## UNIT-I

Advanced Transaction Processing: Advanced transaction models: Save points, Nested and Multilevel Transactions, Compensating Transactions, Long Duration Transactions, Transaction Work Flows, Transaction Processing Monitors, Shared disk systems.

## UNIT-II

Objected Oriented and Object Relational Databases: Modeling Complex Data Semantics, Specialization, Generalization, Aggregation and Association, Objects, Object Identity and its implementation, Clustering, Equality and Object Reference, Architecture of Object Oriented and Object Relational databases, Persistent Programming Languages, Cache Coherence.

## UNIT-III

Parallel and Distributed Databases: Parallel architectures, shared nothing/shared disk/shared memory based architectures, Data partitioning, Intra-operator parallelism, pipelining. Distributed Data Storage – Fragmentation and Replication, Location and Fragment Transparency, Distributed Query Processing and Optimization, Distributed Transaction Modeling and concurrency Control, Distributed Deadlock, Commit Protocols, Design of Parallel Databases.

## UNIT-IV

Active Database and Real Time Databases: Issues with Real time databases, Triggers in SQL, Event Constraint and Action: ECA Rules, Query Processing and Concurrency Control, Compensation and Databases Recovery, multi-level recovery.

## UNIT-V

Image and Multimedia Databases: Modeling and Storage of Image and Multimedia Data, Data Structures – R-tree, k-d tree, Quad trees, Content Based Retrieval: Color Histograms, Textures etc., Image Features, Spatial and Topological Relationships, Multimedia Data Formats, Video Data Model, Audio and Handwritten Data, Geographic Information Systems (GIS).

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## Shri Vaishnav Institute of Computer Applications

Name of Program: BCA + MCA (Banking Technology)

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BCCA615	Elective	Advanced DBMS	4	0	0	4	60	20	20	0	0

WEB Database: Accessing Databases through WEB, WEB Servers, XML Databases.

### Text Books:

1. A Silberschatz, H.F Korth, Sudersan “Database System Concepts”, MGH Publication.
2. C.J. Date “An introduction to Database Systems”.
3. Elmasri and Navathe “Fundamentals of Database systems”, Morgan Kaufman.
4. Elmagarmid. A.K. “Database Transaction Models For Advanced Applications”.
5. J. Gray and A. Reuter, Morgan Kauffman, “Transaction Processing, Concepts and Techniques”.

### Reference Books:

1. R. Ramakrishnan, “Database Management Systems”, McGraw Hill.
2. S. Abiteboul, R. Hull and V. Vianu, “Foundations of Databases”, Addison – Wesley.
3. W. Kim, “Modern Database Systems”, ACM Press, Addison – Wesley.
4. D. Maier, “The Theory of Relational Databases”, Computer Science Press, Rockville.
5. B.C. Desai. “An introduction to Database systems” BPB Publications.

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BCCA635	Elective	Data Mining and Warehousing	4	0	0	4	60	20	20	0	0

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;  
Q/A – Quiz/Assignment/Attendance, MST - Mid Sem Test.

\***Teacher Assessment** shall be based on following components: Quiz/Assignment/Project/Participation in class  
(Given that no component shall exceed 10 Marks)

### Course Educational Objectives (CEOs):

- To familiarize the students with the need and scope of the subject to build the mental makeup of the students for the field of data mining.
- Using simple and well drawn illustrations develop students skills to discover knowledge to support the decision making process.
- To make the students well versed with the latest trends in data warehousing and data mining.

### Course Outcomes (Cos): The student will be able to

- Understand the basic principles, concepts and applications of data warehousing and data mining.
- Introduce the task of data mining as an important phase of knowledge recovery process.
- Ability to do Conceptual, Logical and Physical design of Data Warehouses, OLAP applications and OLAP deployment.
- Have a good knowledge of the fundamental concepts that provide the foundation of data mining.
- Design and implement a data warehouse or data mart to present information needed by management in a form that is usable for management client.
- Design and implement the data preprocessing solutions for different applications.
- Identify and use suitable data mining techniques for Knowledge Discovery.
- Develop dashboard solutions for presentation of knowledge.
- Explore the subject to start as a researcher

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BCCA635	Elective	Data Mining and Warehousing	4	0	0	4	60	20	20	0	0

### UNIT – I

Data Mining: Introduction, Motivation, importance, Data type for Data Mining: relation Databases, Data Warehouses, Transactional databases, advanced database system and its applications, Data mining Functionalities: Concept/Class description, Association Analysis, classification & Prediction, Cluster Analysis, Outlier Analysis, Evolution Analysis, Classification of Data Mining Systems.

### UNIT – II

Data Warehouse and OLAP Technology for Data Mining: Differences between Operational Database Systems and Data Warehouses, a multidimensional Data Model, Data Cube, Data Warehouse Architecture, data warehouse servers.

### UNIT- III

Data Preprocessing: Introduction and need of data preprocessing, data preprocessing as a process, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation. Data Mining Primitives, Concept Description: Characterization and Comparison, Analytical Characterization.

### UNIT – IV

Association Rule Mining: Market Basket Analysis, Basic Concepts, Mining Single-Dimensional Boolean Association Rules from Transactional Databases: different algorithms, the Apriori Partition, Dynamic Itemset Counting, Generating Association rules from Frequent items.

### UNIT – V

Classification and Prediction and Cluster Analysis: Issues regarding classification and prediction, Major Issues in Data Mining, Applications and Trends in Data Mining: Data Mining Applications, currently available tools.

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### Text Books:

1. J. Han and M. Kamber, *Data Mining: Concepts and Techniques*, Morgan Kaufmann Pub., III Edition, 2011
2. Berson, *Data Warehousing, Data Mining and OLAP*, TMH, I Edition, 1997.
3. W.H. Inmon, *Building the Data Warehouse*, Wiley India, III Edition, 2005.
4. Anahory, *Data Warehousing in Real World*, Pearson Education, II Edition, 2012.
5. Adriaans, *Data Mining*, Pearson Education, I Edition, 2002.
6. A.K. Pujari, *Data Mining Techniques*, University Press, Hyderabad, IV Edition, 2016.

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BCBT607	Compulsory	Lab - II (Advanced Java Lab)	0	0	4	2	0	0	0	30	20

**Legends:** L – Lecture; T – Tutorial/Teacher Guided Student Activity; P – Practical; Q/A – Quiz/Assignment/Attendance; MST – Mid Semester Test.

**\*Teacher Assessment** shall be based on following components: Quiz/Assignment/Project/Participation in class activities, (Given that no component shall exceed more than 10 marks)

### Course Educational Objective (CEOs):

The goal of this course is to know & understand concepts of internet programming.

**Course Outcomes (Cos):** Students will be able to understand:.

- Java programming concepts
- JAVA and HTML tools for Internet programming.
- Scripting languages – Java Script.
- Dynamic HTML programming.
- Server Side Programming tools.

### List of Experiments:

1. Java classes and objects
2. Inheritance, Polymorphism
3. Interfaces and Exception Handling, Packages
4. Socket Programming in Java
5. RMI

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BCBT607	Compulsory	Lab - II (Advanced Java Lab)	0	0	4	2	0	0	0	30	20

6. Client side scripting using
  - XHTML,
  - JavaScript/DOM
  - CSS
7. XML DTD, Parsers, XSLT
8. Java Applets, AWT, Swings
9. Server Side programming (implement these modules using any of the server side scripting languages like PHP, Servlets, JSP etc.,)
  - Gathering form data
  - Querying the database
  - Response generation
  - Session management
10. Application development

**Text Books:**

1. Cay S. Horstmann and Gary Cornell, “Core Java™, Volume I – Fundamentals” 8th Edition, Prentice Hall, 2007.
2. Cay S. Horstmann and Gary Cornell, “Core Java, Vol. 2: Advanced Features”, 8<sup>th</sup> Edition, Prentice Hall, 2008.
3. Robert W. Sebesta, “Programming the World Wide Web”, Addison-Wesley, 6<sup>th</sup> Edition, 2010.
4. Elliotte Rusty Harold, “Java Network Programming”, Third Edition, O’Reilly, 2004.
5. Uttam K. Roy, “Web Technologies”, Oxford University Press, 1<sup>st</sup> Edition, 2010.
6. Leon Shklar and Rich Rosen, “Web Application Architecture: Principles.

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