



Shri Vaishnav Vidyapeeth Vishwavidyalaya Indore

Shri Vaishnav Institute of Computer Applications

Name of Program: BCA + MCA

Subject Code	Category	Subject Name	Teaching & Evaluation Scheme								
			Theory			Practical		L	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teacher Assessment	End Sem University Exam	Teacher Assessment				
BCCA601	Compulsory	Advanced Java	60	20	20			3	1		4

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.

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, URLConnection.

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, The SQLWarning Class, The Statement Interface, PreparedStatement, CallableStatement The ResultSet Interface, Updatable Result Sets, JDBC Types, Executing SQL Queries, ResultSetMetaData, Executing SQL Updates, Transaction Management.



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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, Setting Up the JSP Environment, 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, JSF Libraries: PrimeFaces

UNIT – V

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

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 Herbertz Schildt, “Java-2: The Complete Reference”, TMH, 5th edition, 2002.
2. Bill Venner, “Inside Java Virtual Machine”, TMH, 2nd edition.
3. Rick Darnell, “HTML 4 unleashed”, Techmedia Publication, 2000
4. Shelley Powers, “Dynamic Web Publishing”, 2nd edition, Techmedia, 1998.
5. Paul Dietel and Harvey Deitel, “Java How to Program”, PHI, 8th edition, 2010.



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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, 2nd edition
5. Eric Jendrock, Jennifer Ball, Debbi Carson, “The Java EE5 Tutorial”, Pearson, 3rd edition, 2007.
6. Daniel Liang, “Introduction to Java Programming”, Pearson, 7th edition, 2010.

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			End Sem University Exam	Two Term Exam	Teacher Assessment	End Sem University Exam	Teacher Assessment				
BCCA 602	Compulsory	Internet Programming	60	20	20			4	1	0	5

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 Objective:

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

Outcomes course 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.



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UNIT I

Java programming: An overview of Java ,Data Types , Variables and Arrays , Operators , Control Statements , Classes , Objects , Methods , Inheritance , Packages , Abstract classes , Interfaces and Inner classes , Exception handling , Introduction to Threads , Multithreading , String handling , Streams and I/O , Applets.

Unit-II

HTML:Introduction to HTML, WWW and WC, Basic HTML Structure,Common HTML Tag ,Physical and Logical HTML,Types of Images, client side and server-side Image ,mapping ,List, Table, Frames ,Embedding Audio, Video ,HTML form and form elements ,Introduction to HTML Front Page.

Unit-III

CSS (Cascading Style Sheet): Introduction to style sheet, Types of style sheet, Style sheet property, Positioning with style sheet.

Unit-IV

JAVA Script: introduction to Java Script, Identifier & operator, control structure, functions Document object model (DOM), DOM Objects (window, navigator, history, location), Predefined functions, numbers & string functions, Array in Java scripts ,Event handling in Java script.

Unit-V

Active Server Pages (ASP)

HTTP basic, Introduction to ASP, Working with personal web server & IIS, Writing simple ASP pages, Request & Response object, Application and session object. ASP & database, Error handling.

Reference Books:

1. R. Krishnamoorthy& S. Prabhu, “Internet and Java Programming”, New Age International Publishers, 2004.
2. Active Server pages 3.0 in 21 days- by Techmedia
3. Complete HTML- Thomas Powell
4. HTML and JavaScript – Ivan Bayross



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			THEORY			PRACTICAL		L	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment*	End Sem University Exam	Teachers Assessment*				
BCCA603	COMPULSORY	Software Engineering	60	20	20	0	0	4	1	0	5

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 be exceed 10 Marks)

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.



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Unit I

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

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 method sand tools specification – Software requirements Specifications

UNIT III

Structured Analysis: Introduction – the elements of the 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.

Text Books:

1. Roger S. Pressman, Software Engineering – A Practioner's Approach, McGraw Hill, 7th 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, 7th Edition.
3. Elis Awad, "System Analysis & Design", Galgotia publications



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Name of Program: **BCA+MCA**

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment*	End Sem University Exam	Teachers Assessment*				
BCCA604	COMPULSORY	Design and Analysis of Algorithms	60	20	20			4	1	0	5

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 be exceed 10 Marks)

Course Educational Objectives (CEOs):

- To familiarize the students with the need and scope of the subject.
- To develop the analytical skills of students so that they can better understand the problem and devise algorithms efficiently.
- Using simple and well drawn illustrations develop their analytical and programming skills.
- To cover the various data structures and their applications so that aspirants can explore this territory
- to take on the more challenging concepts.

Course Outcomes (Cos): After the completion of the course the student will be able to

- Understand the real world problems and model them
- Understand the algorithms and the algorithm design process
- Choose a suitable strategy to devise solution of a given problem
- identify, formulate and solve programming problems
- select appropriate data structures for the solution of a given problem
- analyze the algorithms for correctness and in terms of complexity for best, worst and average cases
- function on multi-disciplinary teams
- understand the professional and ethical responsibility



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Unit-I

Pre-requisites: Data structure and Discrete structures, models of computation,

Introduction to Algorithm: Definition, Criteria of Algorithm, Algorithm Analysis, Time and Space complexity, asymptotic notation: Big Oh, Omega and Theta, Best, Average and Worst case analysis.

Unit-II

Design of Algorithm, Types of algorithm strategies, Recurrence relation, Analysis of algorithm, Brute-force approach: Sequential search, Selection sort

Divide and conquer: Structure of divide-and-conquer algorithms: examples; Binary search, Merge sort, Quick sort, Strassen's Multiplication; Analysis of divide and conquer methods

Unit-III

Graph searching and Traversal: Overview, Traversal methods (depth first and breadth first search)

Greedy Method: Overview of the greedy paradigm examples of exact optimization solution (minimum cost spanning tree), Approximate solution (Knapsack problem), Single source shortest paths.

Unit-IV

Branch and bound: LC searching Bounding, FIFO branch and bound, LC branch and bound application: 0/1 Knapsack problem, Traveling Salesman Problem, searching & sorting algorithms.

Dynamic programming: An Overview, Difference between Dynamic Programming and Divide And Conquer, Applications: Shortest Path in Graph, Matrix Chain Multiplication, Traveling Salesman Problem, Longest Common Sequence.

Unit-V

Back tracking: Overview, 8-queen problem and Knapsack problem

Computational Complexity: Complexity measures, Polynomial Vs non-polynomial time complexity; NP-hard and NP-complete classes, Relation among P, NP, NPC and NPH, Examples.

References

1. Ullman, "Analysis and Design of Algorithm", TMH
2. Goodman, "Introduction to the Design & Analysis of Algorithms, TMH-2002.
3. Sara Basse, A. V. Gelder, "Computer Algorithms," Addison Wesley
4. T. H. Cormen, Leiserson, Rivest and Stein, "Introduction of Computer algorithm," PHI
5. E. Horowitz, S. Sahni, and S. Rajsekarana, "Fundamentals of Computer Algorithms," Galgotia Publication



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			THEORY			PRACTICAL		L	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment*	End Sem University Exam	Teachers Assessment*				
BCCA615	ELECTIVE	Advanced DBMS	60	20	20			4	-	-	4

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 be exceed 10 Marks)

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 need of data of different organizations
- To develop a better understanding of the recent advancements in the field of Database Management System.
- Using simple and well drawn illustrations develop students skills to store and retrieve data 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 physical and logical database designs, database modeling, relational, hierarchical and network models for real world problems
- use data manipulation language to query, update, and manage a database
- To develop an understanding of essential DBMS concepts such as: database security, integrity, concurrency, distributed database and intelligent database, Client/Server (Database Server), Data Warehousing.
- To 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
- design and build simple and complex database systems and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.



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UNIT-I

Advanced Transaction Processing: Advanced transaction models: Save points, Nested and Multilevel Transactions, Compensating Transactions and Saga, Long Duration Transactions, Weak Levels of Consistency, 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. Case Studies: Gemstone, O2, Object Store, SQL3, Oracle xxi, DB2.

UNIT-III

Deductive Databases: Data log and Recursion, Evaluation of Data log program, Recursive queries with negation.

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, and Parallel Query Evaluation.

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, Recursive query processing, 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).

WEB Database: Accessing Databases through WEB, WEB Servers, XML Databases, Commercial Systems – Oracle xxi, DB2.



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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. B.C. Desai. “An introduction to Database systems” BPB
5. R. Ramakrishnan, “Database Management Systems”, McGraw Hill
6. Elmagarmid. A.K. “Database Transaction Models For Advanced Applications”,
7. “Transaction Processing, Concepts and Techniques”, J. Gray and A. Reuter, Morgan Kauffman.
8. S. Abiteboul, R. hull and V. Vianu, “Foundations of Databases”, Addison – Wesley
9. W. Kim, “Modern Database Systems”, ACM Press, Addison – Wesley.
10. D. Maier, “The Theory of Relational Databases”, Computer Science Press, Rockville,

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			THEORY			PRACTICAL		L	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment*	University Exam	Teachers Assessment*				
BCCA625	ELECTIVE	Organization Structure	60	20	20			4	-	-	4

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

***Teacher Assessment** shall be based on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objectives

The purpose of the course is to give the students an introduction to the field of organization design and structure so as to have a better adaptability to new technologies, markets and challenges.

Course Outcomes

- Understand the major elements of Organisational Structure
- Understand the interrelationship between Management and Organizational design.

Unit I: Role of Management in Organizational Structuring



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1. What Is Management?
2. What Is the Role of Management in Organizations?
3. Who Are Managers Responsible to?
4. Who Should Monitor the Actions of Executives?
5. What Is Corporate Governance?

Unit II: Environment of Organizations

1. The Process of Value Creation
2. Critical Elements of Organizational Design
3. Critical Elements of a Business Model
4. Industry Life Cycle

Unit III: Organization Design

1. Differentiation in Organizational Design
2. Organization Design and Design Effectiveness
3. The Core Parts of Organizational Structure
4. Designing Organizations for Efficiency versus Flexibility?
5. Types of Organizational Design viz. Functional Design, Divisional Design, Generic Hybrid Designs.

Unit IV: Integration of Elements in Organizational Design

1. Main Elements of Integration in Organization Design
2. What Is Coordination?
3. Vertical and Horizontal Coordination Mechanisms
4. Coordination and Teamwork
5. How Do We Achieve Efficiency and Flexibility?

Unit V: Controlling Systems in Organizational Design

1. Traditional Control Systems
2. Contemporary Control Systems
3. Critical Issues Associated with Control Systems
4. How Do We Know Our Design Is Effective?

Text Books:

1. Organization and Development: Strategies, Structures and Process by R. Dale, Sage Publications.
2. Organization and Management by R.D. Agrawal, Tata McGraw Hill.



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3. Organization Development: Interventions and Strategies by S. Ramnarayan, T.V. Rao, K. Singh & S. Ramnarayan, Response Books.
4. Think Like a Manager: Mastering the Secrets of Motivating Yourself and Others by R. Fritz, Jaico Books.

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BBAI104	ELECTIVE	Principles of Micro Economics	60	20	20	-	-	4	-	4	

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

***Teacher Assessment** shall be based on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course objectives

1. To become familiar with the basics of Economic system and the process of economic reforms.
2. To Guide students importance of Economics in Modern Business

Course Outcomes

- Understand microeconomics concepts like demand, consumer behavior and consumption function.
- Understand the relationships across different microeconomic variables.

Unit I: Nature and Scope of Managerial Economics

1. Meaning and Characteristics
2. Scope of Micro Economics for Managerial purpose
3. Economics in Business Decision Making

Unit II: Demand

1. Determinants of Demand
2. Law of Demand-Demand Curve



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3. Elasticity of Demand and its types and Measurement

Unit III: Theory of Consumer Behavior

1. Cardinal and Ordinal Utility Theory
2. Consumer's equilibrium, income consumption curve
3. Price consumption curve, income and substitution effects of normal goods

Unit IV: Demand Forecasting and Theory of Production

1. Purpose, Techniques
2. Production Function (meaning)
3. Law of Diminishing Returns
4. Three stages of Production in Short Run

Unit V Theory of Cost and Market Structure

1. Types of Cost Curves
2. Economies and Diseconomies of scale
3. Perfect Competition
4. Monopoly
5. Monopolistic Competition

Text Books:

1. Dwivedi, D. N.(2009). Managerial Economics. Vikas Publishing House: New Delhi.Latest Edition.
2. VarshneyandMaheshwari(2009). Managerial Economics. Sultan Chand and Sons: New Delhi.Latest Edition.
3. DholakiaandOza(2012). Microeconomics for Management Students.Oxford University Press:New Delhi. Latest Edition.
4. Udipto Roy. Managerial Economics. Asian Book: Kolkata.Latest Edition.
5. Samuelson andNordhaus(2009).Economics .Tata-McGraw Hill: New Delhi.Latest Edition.



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BCCA606	Compulsory	Lab - 1 (Software Development-Minor Project - I JAVA Based)				30	20			6	3

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.

TEXT BOOKS:

1. Patrick Naughton and Herbert Schildt, "Java-2: The Complete Reference", TMH, 5th edition, 2002.
2. Bill Venner, "Inside Java Virtual Machine", TMH, 2nd edition.
3. Rick Darnell, "HTML 4 unleashed", Techmedia Publication, 2000
4. Shelley Powers, "Dynamic Web Publishing", 2nd edition, Techmedia, 1998.
5. Paul Dietel and Harvey Deitel, "Java How to Program", PHI, 8th edition, 2010.



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REFERENCE BOOKS:

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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, 2nd edition
5. Eric Jendrock, Jennifer Ball, Debbei Carson, "The Java EE5 Tutorial", Pearson, 3rd edition, 2007.
6. Daniel Liang, "Introduction to Java Programming", Pearson, 7th edition, 2010.

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BCCA607	Compulsory	Lab-2 (Internet Programming Lab)	--	--	--	30	20	-	-	4	2

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

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

Outcomes course 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.



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List of Experiments:

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

Reference 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”, 8th Edition, Prentice Hall, 2008.
3. Robert W. Sebesta, “Programming the World Wide Web”, Addison-Wesley, Sixth Edition, 2010.
4. Elliotte Rusty Harold, “Java Network Programming”, Third Edition, O’Reilly, 2004.
5. UttamK.Roy, “Web Technologies”, Oxford University Press, 1st Edition, 2010. Leon Shklar and Rich Rosen, “Web Application Architecture: Principles,