



Shri Vaishnav Vidyapeeth Vishwavidyalaya

B.Tech.(CSE) in Cloud and Mobile Computing (in association with IBM) Choice Based Credit System (CBCS)

COURSE CODE	Category	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTMA301		Applied Mathematics-III	60	20	20	-	-	3	1	-	4

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

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

COURSE OBJECTIVES

To introduce the students with the fundamentals of the Calculus of the Complex Variable, Random Variables and Fourier analysis.

COURSE OUTCOMES

After the successful completion of this course students will be able to:

1. Understand and apply the basics of the Calculus of the Complex variables.
2. Know the fundamentals of the Probability Theory and Random Process.
3. Apply the concepts of the Fourier Analysis
4. Know the techniques of the Fourier Transform.

SYLLABUS

UNIT-I

Complex Analysis

Complex numbers, geometric representation, powers and roots of complex numbers. Functions of a complex variable: Limit, Continuity, Differentiability, Analytic functions, Cauchy-Riemann equations, Harmonic functions, Harmonic conjugates. Elementary Analytic functions (polynomials, exponential function, trigonometric functions), Complex integration, Cauchy's integral theorem, Cauchy's integral formula. Taylor series and Laurent series. Zeros, Singularities and its classifications, Residues, Residue theorem and its applications.

UNIT-II

Probability Theory and Random Process

Axiomatic construction of the theory of probability, independence, conditional probability, and basic formulae, random variables, binomial, poisson and normal random variable, probability distributions, functions of random variables; mathematical expectations, Definition and classification of random processes, discrete-time Markov chains, Poisson process, Correlation and Regression; Expectation and Variance

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UNIT–III

Fourier series

Fourier Integral, Fourier series of 2π periodic functions, Fourier series of odd and even functions, Half-range series, Convergence of Fourier series, Gibb's phenomenon, Differentiation and Integration of Fourier series, Complex form of Fourier series.

UNIT–IV

Fourier Transformation

Fourier Integral Theorem, Fourier Transforms, Properties of Fourier Transform, Convolution and its physical interpretation, Statement of Fubini's theorem, Convolution theorems, Inversion theorem.

UNIT–V

Partial Differential Equations

Introduction to PDEs, basic concepts, Linear and non-linear first order PDE, Higher order linear homogeneous PDE, Separation of variable and its application to the one dimensional wave and heat equation.

TEXT BOOKS:

1. R. V. Churchill and J. W. Brown, Complex Variables and Applications, 5th Edition, McGraw-Hill, 1990.
2. K. SankaraRao, Introduction to Partial Differential Equations, 2nd Edition, 2005.
3. G. R. Grimmett and D. R. Stirzaker, Probability and Random Processes, Oxford University Press, 2001.
4. P. G. Hoel, S. C. Port and C. J. Stone, Introduction to Probability Theory, Universal Book Stall, 2000.
5. W. Feller, An Introduction to Probability Theory and its Applications, Vol. 1, 3rd Edition, Wiley, 1968.
6. K. S. Trivedi, Probability and Statistics with Reliability, Queuing, and Computer Science Applications, Prentice Hall of India, 1998.
7. A. Papoulis and S. Unnikrishna Pillai, Probabilities, Random Variables and Stochastic Processes, 4th Edition, Tata McGraw-Hill, 2002.
8. S.M. Ross, Stochastic Processes, 2nd Edition, Wiley, 1996.
9. J. Medhi, Stochastic Processes, New Age International, 1994.
10. B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers, Delhi.

REFERENCES:

1. J. H. Mathews and R. W. Howell, Complex Analysis for Mathematics and Engineering, 3rd Edition, Narosa, 1998.
2. I. N. Sneddon, Elements of Partial Differential Equations, McGraw-Hill, 1957.
3. E. Kreyszig, Advanced Engineering Mathematics, 5th / 8th Edition, Wiley Eastern / John Wiley, 1983/1999.

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BTCS302		Data Communication	60	20	20	-	50	3	1	2	5

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

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COURSE OBJECTIVES

1. To understand the concepts of data communications.
2. To be familiar with the Transmission media and Tools.
3. To study the functions of OSI layers.
4. To learn about IEEE standards in computer networking.
5. To get familiarized with different protocols and network components.

COURSE OUTCOMES

Upon completion of the subject, students will be able to:

1. Understand the Process and functions of data communications
2. Understand Transmission media and Tools
3. Understand the functions of OSI layers
4. Understand IEEE standards in computer networking
5. Understand different protocols and network components.

SYLLABUS

UNIT-I

DATA COMMUNICATIONS

Data communication Components, Data representation and Data flow, Networks, Types of Connections, Topologies, Protocols and Standards, OSI model, Transmission Media, LAN, Wired LANs, Wireless LANs, Connecting LANs, Virtual LANs.

UNIT-II

DATA LINK LAYER

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Error Detection and Error Correction, Introduction–Block coding–Hamming Distance, CRC, Flow Control and Error control, Stop and Wait, Go back– N ARQ, Selective Repeat ARQ, Sliding Window, Piggybacking, Random Access, CSMA/CD, CDMA/CA.

UNIT–III

NETWORK LAYER

Switching, Logical addressing, IPV4, IPV6, Address mapping, ARP, RARP, BOOTP and DHCP, Delivery, Forwarding and Unicast Routing protocols.

UNIT–IV

TRANSPORT LAYER

Process to Process Delivery, User Datagram Protocol, Transmission Control Protocol, SCTP, Congestion Control with Examples.

UNIT–V

APPLICATION LAYER

Domain Name Space, DDNS, TELNET, EMAIL, File transfer, WWW, HTTP, SNMP, Cryptography, Basic concepts.

TEXT BOOKS:

1. Behrouz A. Forouzan, “Data communication and Networking”, Tata McGraw– Hill, Fourth Edition, 2011.
2. “Data and Computer Communications” William Stallings.

REFERENCES:

1. Larry L. Peterson, Peter S. Davie, “Computer Networks”, Elsevier, Fifth Edition, 2012.
2. William Stallings, “Data and Computer Communication”, Eighth Edition, Pearson Education, 2007.
3. James F. Kurose, Keith W. Ross, “Computer Networking: A Top–Down Approach Featuring the Internet”, Pearson Education, 2005.

LIST OF EXPERIMENTS:

1. To Study different type of Transmission Media.
2. To Study LAN using star topology.
3. To Study LAN using bus topology.
4. To Study LAN using tree topology.
5. To Study and configure modem of Computer.
6. To Study configure Hub/Switch.
7. To Study interconnection of cables for data communication.
8. To Study fiber optic communication.
9. To Study Wireless communication.
10. To Study PC-PC communication using LAN.

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BTCS303		Principles of Programming Languages	60	20	20	30	20	3	1	2	5

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COURSE OBJECTIVES

1. To improve the background for choosing appropriate programming languages for certain classes of programming problems.
2. To be able in principle to program in an imperative (or procedural), an object-oriented, a functional, and a logical programming language.
3. To Understand the significance of an implementation of a programming language in a compiler or interpreter
4. To Increase the ability to learn new programming languages
5. To Increase the capacity to express programming concepts and choose among alternative ways to express things

COURSE OUTCOMES

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes:

1. Students will Gain insight and develop understanding to the underlying principles and concepts of programming languages. Also Gain an overview of programming language translation process.
2. Students will be able to competent with analyzing programming language design issues related to data types, expressions and control structures.
3. Students will be able to describe the concept of sub-programming with the help of Functions. Also develop understanding with the parameter passing techniques and concept of function overloading.
4. Students will be able to analyze various memory management techniques as well as apply various concepts of object oriented programming.
5. Students will be able to develop understanding with the exception handling concept and gain knowledge of logical and function programming.

SYLLABUS

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UNIT-I

Preliminary Concepts: Reasons for studying, concepts of programming languages, Programming domains, Language Evaluation Criteria, influences on Language design, Language categories, Programming Paradigms – Imperative, Object Oriented, functional Programming, Logic Programming. Programming Language Implementation – Compilation and Virtual Machines, programming environments. Issues in Language Translation: Syntax, Semantics, Stages, analysis and synthesis, Parse Tree, CFG and BNF grammar.

UNIT-II

Data types: Introduction, primitive, character, user defined, array, associative, record, union, pointer and reference types, design and implementation uses related to these types. Names, Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization. Expressions and Statements: Arithmetic relational and Boolean expressions, Short circuit evaluation mixed mode assignment, Assignment Statements, Control Structures – Statement Level, Compound Statements, Selection, Iteration, Unconditional Statements, guarded commands.

UNIT-III

Subprograms and Blocks: Fundamentals of sub-programs, Scope and lifetime of variable, static and dynamic scope, Design issues of subprograms and operations, local referencing environments, parameter passing methods, overloaded sub-programs, generic sub-programs, design issues for functions overloaded operators, co routines.

UNIT-IV

Abstract Data types: Abstractions and encapsulation, introductions to data abstraction, Static and Stack-Based Storage management. heap based storage management. Garbage Collection. object oriented programming in small talk, C++, Java, C#, PHP, Perl. Concurrency: Subprogram level concurrency, semaphores, monitors, message passing, Java threads, C# threads. Exception handling, Exceptions, exception Propagation, Exception handler in C++ and Java.

UNIT-V

Functional Programming Languages: Introduction, fundamentals of FPL, LISP, ML, Haskell, application of Functional Programming Languages and comparison of functional and imperative Languages. Scripting Language: Pragmatics, Key Concepts. Logic Programming Language : Introduction and overview of logic programming, basic elements of prolog, application of logic programming. Introduction to 4GL.

TEXT BOOKS:

1. Concepts of Programming Languages Robert .W. Sebesta 8/e, Pearson Education, 2008.
2. Programming Language Design Concepts, D. A. Watt, Wiley dreamtech, rp-2007.
3. Sebesta, "Concept of programming Language", Pearson Edu.

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REFERENCES:

1. Programming Languages, 2nd Edition, A.B. Tucker, R.E. Noonan, TMH.
2. Programming Languages, K. C.Louden, 2nd Edition, Thomson, 2003.
3. LISP, Patric Henry Winston and Paul Horn, Pearson Education.
4. Programming in Prolog, W.F. Clocksin, & C.S. Mellish, 5th Edition, Springer.
5. Terrance W Pratt, "Programming Languages: Design and Implementation" Pearson Edu.

LIST OF EXPERIMENTS:

1. Write a Program to implement type conversion and type casting.
2. Write a program to implement dynamic binding.
3. Write a program to implement scope rules.
4. Write a program to depict subprogram concept.
5. Write a program to create an abstract data type for complex numbers and perform basic operations such as Addition, subtraction and multiplication of two complex numbers on it.
6. Write a program to implement Exception handling in Java.
7. Write a Program to implement various message passing techniques in C.
8. Prepare a Case Study on: LISP.
9. Prepare a Case Study on: Prolog.
10. Prepare a Case Study on: ML.

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BTEC304	EC	Electronic Devices and Circuits	60	20	20	30	20	3	1	2	5

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COURSE OBJECTIVES

The objective of this course is to-

- 1) Use abstractions to analyze and design simple electronic circuits.
- 2) Design and construct circuits, take measurements of circuit behavior and performance, compare with predicted circuit models and explain discrepancies.

COURSE OUTCOMES

Students who are successful in this class will be able to:

1. Understand the basic physics of carrier transport in bulk semiconductors and real device structures.
2. Understand the fundamentals of operation of the main semiconductor electronic devices.
3. Understand the basic parameters of electronic devices, their performance, and limiting factors.
4. Understand the basic principles of electronic device.

SYLLABUS

UNIT-I

Physical Electronics: Electrons and holes in semiconductors, Carrier Statistics, Energy bands in intrinsic and extrinsic silicon; Mechanism of current flow in a semiconductor; Carrier transport: diffusion current, drift current, mobility and resistivity; Generation and recombination of carriers; Poisson and continuity equations, Hall Effects.

UNIT-II

PN junction diode: PN junction diode in forward and reverse bias, temperature dependence of V-I characteristics, diode resistances, diode junction capacitance. Types of diodes: Zener Diode, Varactor Diode, Tunnel Diode, PIN Diode, Schottky Diode, LED and Photo Diodes, Switching characteristics of diode.

Bipolar junction transistor: Construction, basic operation, current components and equations, CB, CE and CC configuration, input and output characteristics, Early effect, Region of operations: active,

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cut-off and saturation region. BJT as an amplifier. Ebers-Moll model, Power dissipation in transistor (P_d , max rating), Photo transistor.

UNIT-III

Transistor biasing circuits and analysis: Introduction, various biasing methods: Fixed bias, Self bias, Voltage Divider bias, Collector to base bias, Load-line analysis: DC and AC analysis, Operating Point and Bias Stabilization and Thermal Runaway. Transistor as a switch.

UNIT-IV

Small Signal analysis: Small signal Amplifier, Amplifier Bandwidth, Hybrid model, analysis of transistor amplifier using h-parameter, Multistage Amplifier: Cascading amplifier, Boot-strapping Technique, Darlington amplifier and cas-code amplifier, Coupling methods in multistage amplifier, Low and high frequency response, Hybrid π model, Current Mirror circuits.

Large Signal analysis and Power Amplifiers: Class A, Class B, Class AB, Class C, Class D, Transformer coupled and Push-Pull amplifier

UNIT-V

FET: JFET- Construction, n-channel and p-channel transistors, drain and transfer characteristics, parameters, Equivalent model and voltage gain, analysis of FET in CG, CS and CD configuration. Enhancement and Depletion MOSFET drain and transfer Characteristics.

Uni-junction Transistor (UJT): UJT - Principle of operation, characteristics, UJT relaxation oscillator, PNP Diode and its characteristics,

Thyristors: Silicon controlled rectifier: V-I characteristics, DIAC and TRIAC, Thyristors parameters and applications.

TEXT BOOKS:

1. Boylestad and Nashelsky, "Electronic Devices and Circuit Theory", 11th Edition, Pearson, 2013.
2. Sedra and Smith, "Microelectronics", 7th Edition, Oxford Press.

REFERENCES:

1. Ben G. Streetman, Sanjay Bannerjee, "Solid State Electronic Devices", 6th Edition, Pearson Prentice Hall, 2006.
2. David A Bell, "Electronic Devices and Circuits", Oxford, 2008.
3. Millman, Halkias 7 Parikh, "Integrated electronics", 2nd Edition, TMH, 2017.
4. Donald A Neamen, "Electronic Circuits Analysis and Design", 3rd Edition, McGraw Hill, 2006.
5. Robert F. Pierret, "Semiconductor Device Fundamentals", 1st Edition, Pearson, 2006.

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LIST OF EXPERIMENTS:

1. To determine and analyze the V-I characteristics of PN Junction diode.
2. To determine and analyze the V-I characteristic of Zener diode and its load regulation capability.
3. To design clipper and clamper circuits.
4. To determine input and output characteristics of transistor amplifiers in CE configurations.
5. To determine input and output characteristics of transistor amplifiers in CC configurations.
6. To determine input and output characteristics of transistor amplifiers in CB configurations.
7. To determine the frequency response of CE amplifier, direct coupled and RC coupled amplifier.
8. To determine Drain and Transfer Characteristics of JFET Amplifier.
9. To determine Drain and Transfer Characteristics of MOSFET Amplifier.
10. To determine characteristics of class A and B power amplifiers.

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BTCS308		Object Oriented Programming using Java	60	20	20	30	20	3	1	2	5

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BTCS306		Web Application Lab	-	-	-	-	50	-	-	2	1

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

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COURSE OBJECTIVES

1. To broaden the knowledge of WWW, Internet, HTTP, URL, DNS, Web browser, Web Server and FTP.
2. To aware the benefits and future of Web Applications.
3. To increase proficiency in scripting languages.
4. To understand the web architecture and how a Web client-server interaction happens.
5. To know about the Website Development Process.
6. To be familiar with how a search engine & Meta search engine works and advantages, disadvantages of Meta search engine over a search engine.

COURSE OUTCOMES

1. Students will know about the history of the internet and related internet concepts that are vital in understanding web development.
2. Students will know about the insights of internet programming and implement complete application over the web.
3. Students will be able to demonstrate the important HTML tags for designing static pages and separate design from content using Cascading Style sheet.
4. Students will know about the web architecture and Web client-server model working.
5. Students will be able to create basic static website and can use the web application development software tools.
6. Students will understand search engine's working and its advantages, disadvantages.

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UNIT-I

Introduction to WWW, Internet, Evolution of Markup Languages - SGML, HTML, XML and XHTML WML, its markup tag HTML Frames, Tables, Images and Forms. DHTML and Cascading Style Sheets. Introduction of HTTP, URL, DNS, Web browser, Web Server and FTP. Fillzilla software. Web server-IIS & Apache.

UNIT-II

Introduction to web application & benefits, Developing Simple Web Applications like Information System Front-end, Quizzes, Puzzles, Web Applications, Application server, Basic Web Architecture, Security, Performance of web applications.

UNIT-III

Basic of scripting languages, What is Javascript, How to develop Javascript, simple Javascript, variables, functions, conditions, loops and repetition, events and buttons, controlling your browser, Client side scripting, Server side scripting, PHP, Starting to script on server side, Arrays, function and forms, advance PHP Databases : Basic command with PHP examples, Connection to server, creating database, selecting a database. .NET Basics.

UNIT-IV

Web architecture introduction, basic working, client server model, CGI, Information Architecture: Role, Collaboration and Communication, Organizing Information, Organizational Challenges, Organizing Web sites parameters and Intranets. Cookies: Creating and Reading.

UNIT-V

Browser and search engines: Introduction, Search fundamentals, Search strategies, Directories search engines and Meta search engines, working of the search engines.

TEXT BOOKS:

1. Internet & World Wide Web How to Program, Pearson education, 3rd edition, by: H.M. Deitel, P.J. Deitel, A.B. Goldberg.
2. C. Xavier, "Web Technology & Design", Tata McGraw Hill.
3. Ivan Bay Ross, "HTML, DHTML, Java script, Perl CGI", BPB.
4. Neil Gray, "Web server Programming" Wiley.

REFERENCES:

LIST OF EXPERIMENTS:

1. Write a html program for Creation of web site with forms, frames, links, tables etc
2. Design a web site using HTML and DHTML. Use Basic text Formatting, Images,

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3. Create a script that asks the user for a name, then greets the user with “Hello” and the user name on the page
4. Create a script that collects numbers from a page and then adds them up and prints them to a blank field on the page.
5. Create a script that prompts the user for a number and then counts from 1 to that number displaying only the odd numbers.
6. Create a script that will check the field in Assignment 1 for data and alert the user if it is blank. This script should run from a button.
7. Using CSS for creating web sites
8. Creating simple application to access data base using JDBC Formatting HTML with CSS.
9. Program for manipulating Databases and SQL.
10. Program using PHP database functions.
11. Write a web application that functions as a simple hand calculator, but also keeps a “paper trail” of all your previous work
12. Install Tomcat and use JSP and link it with any of the assignments above
13. Reading and Writing the files using .Net
14. Write a program to implement web service for calculator application
15. Implement RMI concept for building any remote method of your choice.

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BTCS307		Advanced Java	-	-	-	30	20	-	-	2	1

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COURSE OBJECTIVES

1. Using Graphics, Animations and Multithreading for designing Simulation and Game based applications.
2. Design and develop GUI applications using Abstract Windowing Toolkit (AWT), Swing and Event Handling.
3. Design and develop Web applications
4. Designing Enterprise based applications by encapsulating an application's business logic.
5. Designing applications using pre-built frameworks.

COURSE OUTCOMES

Upon completion of this course, students will be able to do the following:

1. Use various tools, and Validation techniques, use of different templates available in IntelliJ IDEA, Implementation and testing strategies in real time applications.
2. Learn the Internet Programming, using Java Applets
3. Create a full set of UI widgets and other components, including windows, menus, buttons, checkboxes, text fields, scrollbars and scrolling lists, using Abstract Windowing Toolkit (AWT) & Swings
4. learn to access database through Java programs, using Java Data Base Connectivity (JDBC)
5. Create dynamic web pages, using Servlets and JSP
6. Make a reusable software component, using Java Bean
7. Invoke the remote methods in an application using Remote Method Invocation (RMI)

SYLLABUS

UNIT-I

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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.

UNIT-II

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.

UNIT-III

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-IV

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-V

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

TEXT BOOKS:

1. Black Book “Java server programming” J2EE, 1st ed., Dream Tech Publishers, 2008. 3. Kathy walrath.”
2. Complete Reference J2EE by James Keogh mcgraw publication.
3. Professional Java Server Programming by SubrahmanyamAllamaraju, Cedric Buest Wiley Publication.
4. SCWCD, Matthew Scarpino, HanumantDeshmukh, JigneshMalavie, Manning publication
5. Core Java, Volume II: Advanced Features by Cay Horstmann and Gary Cornell Pearson Publication.

REFERENCES:

1. Java Server Faces in Action, Kito D. Mann, Manning Publication.

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B.Tech.(CSE) in Cloud and Mobile Computing (in association with IBM) **Choice Based Credit System (CBCS)**

2. JDBC™ API Tutorial and Reference, Third Edition, Maydene Fisher, Jon Ellis, Jonathan Bruce, Addison Wesley.
3. Beginning JSP, JSF and Tomcat, Giulio Zamboni, Apress.
4. JSF 2.0 Cookbook, Anghel Leonard, PACKT publication.
5. Head First Servlets and JSP by Bryan Basham, Kathy Sierra & Bert Bates, Publisher: O'Reilly Media.

LIST OF EXPERIMENTS:

1. Create chat application using either TCP or UDP protocol.
2. Implement TCP Server for transferring files using Socket and ServerSocket
3. Implement any one sorting algorithm using TCP/UDP on Server application and Give Input On Client side and client should sorted output from server and display sorted on input side.
4. Implement Concurrent TCP Server programming in which more than one client can connect and communicate with Server for sending the string and server returns the reverse of string to each of client
5. Write RMI application where client supplies two numbers and server response by summing it. Provide your custom security policy for this application.
6. Implement Student information system using JDBC and RMI.
7. Create Servlet file which contains following functions:
 1. Connect 2. Create Database 3. Create Table 4. Insert Records into respective table 5. Update records of particular table of database 6. Delete Records from table. 7. Delete table and also database.
8. User can create a new database and also create new table under that database. Once database has been created then user can perform database operation by calling above functions. Use following Java Statement interface to implement program:
 1. Statement 2. Prepared statement 3. Callable statement.
9. Create Servlet file and study web descriptor file.
10. Create login form and perform state management using Cookies, Http Session and URL Rewriting.

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