Shri Rawatpura Sarkar University, Raipur

Examination Scheme & Syllabus

For

Master of Computer Application

Semester-1

(Effective from the session: 2022-23)

Department of Computer Science

Faculty of Engineering,
Shri Rawatpura Sarkar University, Raipur
Master of Computer Application
Teaching & Examination Scheme –Semester –I
(Effective from the session: 2022-23)

S.N.	Course Code	Th/Pr	Subject	Type of Course	Teaching hours per week			TC	Examination Scheme				Total Marks
					L	T	P		Theory		Practical		
									EX	IN	EX	IN	
1	SMC04-101	Th	Communication Skills	Core	3	1	-	4	70	30	-	-	100
2	SMC04-102	Th	Mathematical Foundation of Computer Science	Core	3	1	-	4	70	30	-	-	100
3	SMC04-103	Th	Data Structure with C++	Core	3	1	-	4	70	30	-	-	100
4	SMC04-104	Th	Software Engineering and Project Management	Core	3	1	-	4	70	30	-	-	100
5	SMC04-105	Th	Advance Data Base Management System	Core	3	1	-	4	70	30	-	-	100
6	SMC04-106	Th	Advanced Java	Core	3	1	-	4	70	30	-	-	100
7	SMC04-191	Pr	Data Structure with C++ (Lab)	Core	-	-	4	2	-	-	35	15	50
8	SMC04-192	Pr	Advance Data Base Management System (Lab)	Core	-	-	4	2			35	15	50
9	SMC04-193	Pr	Advanced Java Lab	Core	-	-	4	2			35	15	50
Total Contact hrs. per week: 30				**Total Credit: 30**					**Grand Total Marks:**				**750**

Course Title	**COMMUNICATION ENGLISH**			
Course Code	**SMC04-101**			
Semester	**MCA – 1st**			
Course Credits	**L**	**T**	**P**	**TC**
	3	**1**	**-**	**4**
Prerequisites	Basic knowledge about English language and communication skill.			
Course Objectives	• At the completion of the course student shall be able to: - Understand the knowledge of communication in English. Communicate effectively (Verbal and Non Verbal). Effectively manage the team as a team player. Develop interview skills.			
Course Contents	**UNIT – I** **Key Concepts: -**Process and Elements of Communication: context of communication; the Speaker/writer and the listener/reader, Medium of communication; Principles of communion, communication (7 C's of communication), Barriers in communication, effective Communication; Communication in organization. **UNIT – II** Selecting material for expository, descriptive, and argumentative pieces; Resume; covering letter, Elements of letter writing and style of writing, business letters: Quotation and Tenders; Basics of Informal and Formal Reports-technical report Writing, lab report; Précis writing. **UNIT – III** **Reading:-**Effective Reading; reading different kinds of texts for different purposes; reading, Between the lines. Comprehension of Unseen Passages, Grammar in use: Errors of Accidence and syntax with reference to Parts of Speech; Agreement of Subject and Verb; Tense and Concord; Use of connectives, Question tags. Voice and Narration. Indian's in English: Punctuation and Vocabulary, Building (Antonym, Synonym, Verbal Analogy. **UNIT – IV** **Speaking:-**Achieving desired clarity and fluency; effective speaking; task-oriented, inter-Personal, informal and Semiformal speaking. Meetings, Seminar, Conferences, Interviews, Presentation, Audiovisual communication.			

	UNIT – V
	Listening:-Achieving ability to comprehend material delivered at relatively fast speed; comprehending spoken material in Standard, Indian English, British English and American English; Intelligent listening in situations. Advantages of listening. Hearing and Listening; Essentials of Good Listening. Use of Modern Communication Devices; Telephonic Conversation.
Course Outcomes	• This course student will be able to understand the literatures for presenting the real extract of the subject to the society.
Text Books	1. Sharma RC Mohan K – "Business Corresponding and Report Writing", Tata McGraw Hill, New Delhi, 1994. 2. Alok Jain, P S Bhatia A M Shiekh – "Professional Communication Skills; S. Chand Company Ltd. 2005. 3. Rajendra Pal and JS Korlahalli – "Essentials of Business Communication", Sultan Chand Sons, 1997. 4. A guide to Correct English – Oxford University Press, Ely House, London W, Latest Edition. (For UnitIII).
Reference Books	1. Fiske, john – "Introduction to Communication Studies", Rotledge London,1990. 2. Geoffrey Leech JanSvartvik – "A Communicative Grammar of English", ELBS Longman, England. 3. Bill Scott – "The Skills of Communicating", JaicoPublishing House, Mumbai,2004. 4. Gartside L- "Model Business Letters", Pitman, London,1992. 5. Krishna Mhan N. P. Singh – "Speaking English Effectively"; McMan India, New Delhi; 2001.

Course Title	Mathematical Foundation of Computer Science				
Course Code	SMC04-102				
Semester	MCA – 1st				
Course Credits	**L**	**T**	**P**	**TC**	
	3	**1**	**-**	**4**	
Prerequisites	Basic knowledge of mathematics.				
Course Objectives	1. To make student learn the logical structure of statement, Boolean algebra and its valid applications. 2. To make students learn concepts of relations and functions. 3. To make students learn Cartesian product of sets and grammars 4. To make students understand the concepts of graphs and their matrix representation. 5. To make students learn the basic concepts of Graph theory and its application in coding.				
Course Contents	**UNIT–I Mathematical Logic & Boolean Algebra:** Statements & Notations, Connectives, Normal Forms, Basic concepts of Boolean Algebra, Boolean functions, Applications of Boolean Algebra in Switching Circuits, Logic circuits, Karnaugh maps, methods for simplification of Boolean expressions.. **UNIT–II Ordered Structures, Relations & Functions:** Tuples, Lists, Strings & Languages, Numerals Relations, Properties of Relations, Partial order Relation, Lattices. Functions, Properties of Functions, Composition of Functions, The map function & some useful functions. **UNIT-III Construction Techniques & Grammars** : Inductively defined sets, Numbers, Strings, Lists, Binary Trees, Cartesian product of sets, Recursive functions and Procedures, Grammars. **UNIT-IV Graph Theory** : Basic Concepts of graph theory, Path & Circuits, Trees & Fundamentals , Circuits, Matrix representation of graphs, Directed Graphs. **UNIT-V Group Theory & Coding**: Basic Concepts of Group Theory, Homomorphism & Isomorphism of Groups, Cosets & Langrage's Theorem , Elements of Coding Theory, Group codes, Decoding, Hamming Matrices, Parity check & Generator Matrices				
Course Outcomes	1. Students will be able to analyze the logical structure of statements symbolically including the proper use of logical connectives, applications of Boolean algebra in circuits and karnaugh map. 2. Students will be able to determine whether a relation is reflective, symmetric and transitive. They will be able to apply the different types of functions and Hash diagram. 3. Students will be able to construct inductively defined sets and recursive function.				

	Also they will construct the grammars.
	4. Student will be able to understand the basics of Graph Theory and trees.
	5. Student will be able to understand the basics of Group Theory and coding.
Text Books	1. Discrete Structure, and Logic and Computability, James L. Hein, Narosa Pub. House. 3rd Edition.
	2. Discrete Mathematical Structures with Applications to Computer Science, Trem blay, J.P. & Manohar .R., Tata McGraw Hill. 2000.
Reference Books	1. Discrete and Combinatorial Mathematics, Ralph, Grimaldi, Pearson Education.5th edition.
	2. Graph Theory with Applications to Engineering & Computer Science, N. Deo, Prentice Hall. 2004.
	3. Discrete Mathematical Structures, Kolman, B, Busby, R.C.Ross, S.C. Pearson Education. 2006.
	4. Elements of Discrete Mathematics, Liu, C.L. 2006Tata McGraw Hill, 2nd edition.

Course Title	Data Structure with C++
Course Code	**SMC04-103**
Semester	**MCA – 1st**

Course Credits	**L**	**T**	**P**	**TC**	
	3	**1**	**-**	**4**	

Prerequisites	Students should be able to understand the basic knowledge of C & C++ Programming and its Data Types.
Course Objectives	1. To comprehend the fundamentals of object oriented programming, particularly in C++. 2. To use object oriented programming to implement data structures. 3. To introduce linear, non-linear data structures and their applications.
Course Contents	**UNIT- I DATA ABSTRACTION & OVERLOADING:** Overview of C++ , Structure, Class Scope & Accessing, Class Members, Reference Variables, Initialization ,Constructors, Destructors, Members Functions & Classes , Friend Function, Dynamic Memory Allocation, Static Class Members, Overloading Function overloading & Operator Overloading. **UNIT-II INHERITANCE & POLYMORPHISM** Base Classes and Derived Classes – Protected Members – Casting Class pointers and Member Functions – Overriding – Public, Protected and Private Inheritance – Constructors and Destructors in derived Classes – Implicit Derived – Class Object To Base – Class Object Conversion – Composition Vs. Inheritance – Virtual functions – This Pointer – Abstract Base Classes and Concrete Classes – Virtual Destructors – Dynamic Binding. **UNIT-III LINEAR DATA STRUCTURES:** Abstract Data Types (ADTs) – List ADT – array-based implementation – linked list implementation — singly linked lists –Polynomial Manipulation – Stack ADT – Queue ADT – Evaluating arithmetic expressions. **UNIT-IV NON-LINEAR DATA STRUCTURES:** Trees, Binary Trees, Binary Trees representation & traversals, Application of Trees, Set Representation & Union Find Operations, Graphs & Its Representation, Graph Traversals, Representation of Graphs, Breadth First Search, Depth First Search, Connected Components. **UNIT-V SORTING and SEARCHING:** Searching, Hashing and Sorting: Requirement of a search algorithms; sequential search, binary search, indexed sequential search, interpolation search, Hashing- Basics, methods, collision, resolution of collision, chaining; Internal Sorting, External sorting - Selection sort,

	Bubble sort, Merge sort, quick sort, shell sort, heap sort.
Course Outcomes	1. Explain the concepts of Object oriented programming. 2. Write simple applications using C++. 3. Discuss the different methods of organizing large amount of data.
Text Books	1. K.R. Venugopal, Raj Kumar and T. Ravi Shankar ,Mastering C++, TMH 2. Deitel and Deitel, "C++, How To Program", Fifth Edition, Pearson Education, 2005. 3. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C++", Third Edition, Addison Wesley, 2007.
Reference Books	1. Bhushan Trivedi, "Programming with ANSI C++, A Step-By-Step approach", Oxford University Press, 2010. 2. Goodrich, Michael T., Roberto Tamassia, David Mount, "Data Structures and Algorithms in C++", 7th Edition, Wiley. 2004. 3. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein, "Introduction to Algorithms", Second Edition, McGraw Hill, 2002.

Course Title	Software Engineering and Project Management
Course Code	SMC04-104
Semester	MCA – 1st

Course Credits	L	T	P	TC	
	3	1	-	4	

Prerequisites	Students should be able to understand the basic knowledge of Programming languages to make the Project.
Course Objectives	1. To provide knowledge to identify problems associated with conventional software development process models and solving through modern component based software development process models. 2. To provide knowledge to develop software requirement specification. 3. To represent workflow environment in the software industry. 4. To provide knowledge to estimate various checkpoints during software development. 5. To provide comprehensive knowledge for software project development and assessment.
Course Contents	**UNIT-I Introduction:** The Software and software engineering problem, approach and goals of software engineering , software process characteristics of a software process, software development process, project management process, software configuration management(SCM) process, Software Development Models: Linear sequential(Waterfall) Model, Prototyping, RAD Incremental Model, Spiral Model, W in model, concurrent development model **UNIT-II Software Requirement Specification(SRS) and cost Estimation**: Need of SRS, Components of SRS, Structure of a requirement document, Cost Estimation , Uncertainties in cost estimation building cost estimation, Size estimation through delivered function point(DFP) and source line of code(SLOC), Cost estimation Model- COCOMO. **UNIT-III Software Management Renaissance :** Conventional Software Management, Evolution of software economics, improving software economics, the old way and the new way, life cycle phases, artifacts of process, model based software architecture, workflows of the process, checkpoints of the process. **UNIT-IV Software Management Discipline :** Interactive Process planning, Project Control and process instrumentation , tailoring the process, looking forward: Modern Project profiles, next generation software economics, and modern process transitions, testing in the transition phase.

	UNIT-V Project Quality and Risk Plan: Quality concepts procedure approach to quality management , quantitative approaches to quality management , quantitative quality management planning, setting the quality goal, quality process planning, defect prevention planning. Concept of risk and risk management, risk assessment, risk identification, risk prioritization, risk control- risk management planning, risk monitoring and tracking, Team development, The structure of the project management plan(PMP), PMP of Infosys.
Course Outcomes	1. The student will have a fair idea about the importance of using software engineering principles in real life projects 2. The student will be able to prepare software requirement sheet for a real life project, keeping in mind the properties of an SRS document. 3. The student will be able to use mathematical models for calculating the size, cost and duration of real life projects 4. The student will be able to develop quality planning either through procedural as well as quantitative approach. 5. The student will be able to develop project manufactured documents (i.e., artifacts) for all phases of development to minimize risk and improvement of quality.
Text Books	1. Pressman Roger, Software Engineering: A Practitioner's Approach TMH, Delhi. 2. Walker Royce, "Software Project Management", Pearson Education.
Reference Books	1. JalotePankaj: An Integrated Approach to software Engineering, Narosa, Delhi. 2. JalotePankaj : Software Project Management in Practice, Addison Wesley. 3. R.E. Fairly, Software Engineering Concepts, McGraw Hill, Inc 1985. 4. Rajib Mall, "Fundamental of Software Engineering" , PHI. 5. B. Hughes & Cotterell, Software Project Management, TMH.

Course Title	Advance Database Mangement System			
Course Code	**SMC04-105**			
Semester	**MCA – 1st**			
Course Credits	**L**	**T**	**P**	**TC**
	3	**1**	**-**	**4**
Prerequisites	Students should be able to understand the basic knowledge of Database Programming and SQL.			
Course Objectives	1. To understand basic concepts of designing and building a database management system. 2. To familiarize student with syntax and implementation of Structured Query Language (SQL). 3. To make students understand the relational model and design relational database management system. 4. To provide detailed knowledge of transaction, concurrency and recovery strategies of DBMS 5. To impart significance of normalization in DBMS and different normalization techniques.			
Course Contents	**Unit I** Formal review of relational database and FDs Implication, Closure, its correctness. **Unit II** 3NF and BCNF, Decomposition and synthesis approaches, Review of SQL99, Basics of query processing, external sorting, file scans. **Unit III** Processing of joins, materialized vs. pipelined processing, query transformation rules, DB transactions, ACID properties, interleaved executions, schedules, serialisability **Unit IV** Correctness of interleaved execution, Locking and management of locks, 2PL, deadlocks, multiple level granularity, CC on B+ trees, Optimistic CC. **Unit V** T/O based techniques, Multiversion approaches, Comparison of CC methods, dynamic databases, Failure classification, recovery algorithm, XML and relational databases.			

Course Outcomes	1.Exposure for students to write complex queries including full outer joins, self-join, sub queries, and set theoretic queries. 2.Knowhow of the file organization, Query Optimization, Transaction management, and database administration techniques
Text Books	1. R. Ramakrishnan, J. Gehrke, Database Management Systems, MGraw Hill, 2004 2. A. Silberschatz, H. Korth, S. Sudarshan, Database system concepts, 5/e, MGraw Hill, 2008.
Reference Books	1. K. V. Iyer, Lecture notes available as PDF file for classroom use. 2. Sql/ Pl/SQL Bayross, Ivan BPB.

Course Title	Advanced Java
Course Code	SMC04-106
Semester	MCA – 1st

Course Credits	L	T	P	TC	
	3	1	-	4	

Prerequisites	• Students should be able to understand the basic knowledge of Java Programming and its Structure.
Course Objectives	• To use Java in a variety of technologies and on different platforms. • To have basic knowledge of Servlets. • To have knowledge of JSP,JDBC and EJB.
Course Contents	**UNIT- I Servlets:** Servlet Structure, Servlet packaging, HTML building utilities, Lifecycle, Single Thread model interface, Handling Client Request : Form Data, Handling Client Request: HTTP Request Headers. Generating server Response: HTTP Status codes, Generating server Response: HTTP Response Headers, Handling Cookies, Session Tracking. **UNIT-II JSP:** Overview of JSP Technology, Need of JSP, Benefits of JSP, Advantages of JSP, Basic syntax, Invoking java code with JSP scripting elements, creating Template Text, Invoking java code from JSP, Limiting java code in J S P , using jsp expressions, comparing servlets and jsp, writing script lets. For example Using Scriptlets to make parts of jsp conditional, using declarations, declaration example. Controlling the Structure of generated servlets: the JSP page directive, import attribute, session attribute, is Elignoreattribute, buffer and auto flush attributes, info attribute ,errorPage and is errorPageattributes, is Thread safe Attribute, extends attribute, language attribute, Including files and applets in jsp Pages, using java beans components in JSP documents **UNIT-III Java Beans & Annotations:** Creating Packages, Interfaces, JAR files and Annotations. The core java API package, Newjava. Lang Sub package, Built-in Annotations. Working with Java Beans. Introspection, Customizers, creating java bean, manifest file, Bean Jar file, new bean, adding controls, Bean properties, Simple properties, Design Pattern events, creating bound properties, Bean Methods, Bean an Icon, Bean info class, Persistence ,Java Beans API. **UNIT-IV JDBC:** Talking to Database, Immediate Solutions, Essential JDBC program, using prepared Statement Object, Interactive SQL tool. JDBC in Action Result sets, Batch updates, Mapping, Basic JDBC data types, Advanced JDBC data types, immediate solutions. **UNIT-V Introduction to EJB:** The Problem domain, Breakup responsibilities, Code Smart not hard, the Enterprise java beanspecification. Components Types. Server Side Component Types, Session Beans,

	MsageDriven Beans, Entity Beans, The Java Persistence Mdel. Container services. DependencyInjection, Concurrency, Instance pooling n caching, Transactions, security, Timers,Naming and object stores, Interoperability, Life Cycle Callbacks, Interceptors, platformintegration. Developing your first EJB. preparation, Definitions, naming conventions,convention for the Examples, coding the EJB, the contract, the bean Implementation class,out of Container Testing, Integration Testing.
Course Outcomes	- After completion of this course the students will be able to apply their basic knowledge of Java programming. - The student will be able to: Use an integrated development environment to write, compile, run, and test advance object-oriented Java programs. - Read and make elementary modifications to Java programs that solve real-world problems.
Text Books	1. Java complete reference - by Patrick naughten & MutScpddt. [TM] 2. Java Primer - by E.Balaguruswami. 3. Johannes Gehrke, TATA MGraw Hill 3rd Edition. 4. Java Programming - Khalid Mghal
Reference Books	1. JAVA: The Complete Reference by Naughton & Schildt - Tata MGraw Hill,1999 2. An Introduction to Java Programming by Daniel Liang Y - , Prentice-Hall India, 1999

Course Title	**Data Structure with C++ Lab**				
Course Code	**SMC04-191**				
Course Credits	**L**	**T**	**P**	**TC**	
	-	**-**	**4**	**2**	
Prerequisites	Basic knowledge about C programming language.				
Course Objectives	• To learn the Computer Fundamental concepts of Data Structure. • To aware students about Problem Solving approach. • To make them to use basic components of Data structure using Programming				
Course Contents	1. Write a Program to demonstrate the use of Output statements that draws any object of your choice e.g Christmas Tree using '*' 2. Write a program that reads in a month number and outputs the month name. 3. Write a program that demonstrate the use of various input statements like getchar(), getch(), scanf(). 4. Write a program to demonstrate the overflow and underflow of various datatype and their resolution? 5. Write a program to demonstrate the precedence of various operators. 6. Write a function to find the GCD and LCM of two numbers. 7. Implement a swap() function which exchanges the values of two integers. Call the function from the main to test the function with different values. 8. Write a C function to remove duplicates from an ordered array. For example, if input array contains 10,10,10,30,40,40,50,80,80,100 then output should be 10,30,40,50,80,100. 9. Write a function to generate the Fibonacci series using recursions? 10. Write a recursive function that adds first 'n' natural numbers? 11. Write a recursive function that finds factorial of a number? 12. Write a program to demonstrate the use of recursion in Tower of Hanoi problem. 13. Write a program to find the number of occurrences of a word in a sentence ? 14. Write a program to concatenate two strings without using the inbuilt function ? 15. Write a program to check if two strings are same or not? 16. Write a program to check whether a string is a palindrome or not? 17. Write a program to find the number of vowels and consonants in a sentence? 18. Write a program that reverse the contents of a string? 19. Write a program to implement a stack and it's operations. 20. Write a program to implement a linear queue, circular queue using an array. 21. Write a program to convert an infix expression into its equivalent postfix expression using a stack. 22. Write a program to evaluate a postfix expression using a stack. 23. Write a program to create and display a linked list of integers. 24. Write a program to create a linked list and define functions to add a node (at the beginning, end and middle), delete a node, search a node and display all the				

nodes.

25. Write a a program to create two linked list and append one list at the end of another using function.
26. Write a program to implement a stack and queue of strings using a linked list.
27. Write a program to implement a priority queue using linked list.
28. Write a program to define functions to add a node (at the beginning, end and middle), delete a node, search a node and display all the nodes in a header circular linked list.
29. Write a program to implement a circular queue over a circular linked list.
30. Write a program to create and display a doubly linked list.
31. Write a program to define the following functions to add a node (at the beginning, end and middle), delete a node (from the beginning, end and middle) from a doubly linked list.
32. Write a program to create and display a doubly circular linked list.
33. Write a programs to sort an array of integers using the techniques of Selection sort, Bubble sort, Insertion sort, Quick sort, Shell sort, Heap sort.
34. Write a program to search for a particular element in an unsorted array of integers using linear search technique.
35. Write a program to demonstrate the technique of Binary search on a sorted array of integers.
36. Write a program to create binary search tree and traverse the tree in preorder, in- order and postorder technique. (Use recursive algorithms for traversals).
37. Write a program to traverse a graph in Depth first technique using a Stack.

Course Outcomes	• Have a comprehensive knowledge of the data structures and algorithms on which file structures and databases are based.
Text Books	1. Aaron MTenenbaum, YedidyahLangsam and Mshe J. Augenstein "Data Structures Using C and C/C++" , PHI 2. Horowitz and Sahani, "Fundamentals of Data Structures", Galgotia Publication
Reference Books	1. R. Kruse etal, "Data Structures and Program Design in C", Pearson Education 2. Lipschutz, "Data Structures" Schaum's Outline Series, TM 3. G A V Pai, "Data Structures and Algorithms", TM

Course Title	**Advanced Database Management System**				
Course Code	**SMC04-192**				
Course Credits	**L**	**T**	**P**	**TC**	
	-	**-**	**4**	**2**	
Prerequisites	Basic knowledge about Database Management System.				
Course Objectives	1. To explore the features of a Database Management Systems. 2. To interface a database with front end tools. 3. To understand the internals of a database system.				
Course Contents	1. Basic SQL. 2. Intermediate SQL. 3. Advanced SQL. 4. ER Modeling. 5. Database Design and Normalization. 6. Accessing Databases from Programs using JDBC. 7. Building Web Applications using PHP & MySQL. 8. Indexing and Query Processing. 9. Query Evaluation Plans. 10. Concurrency and Transactions. 11. Big Data Analytics using Hadoop.				
Course Outcomes	1. Ability to use databases for building web applications. 2. Gaining knowledge about the internals of a database system.				
Text Books	1. R. Ramakrishnan, J. Gehrke, Database Management Systems, McGraw Hill, 2004 Silberschatz, H. Korth, S. Sudarshan, 2. Database system concepts, 5/e, McGraw Hill, 2008.				
Reference Books	1. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, "Database System Concepts", 6th edition, Tata McGraw Hill, 2011 2. Ramez Elmasri, Shamkant B. Navathe, "Fundamentals of Database Systems", 4th Edition, Pearson/Addision wesley, 2007.				

Course Title	Advanced Java Programming
Course Code	SMC04-193
Course Credits	<table><tr><td>L</td><td>T</td><td>P</td><td>TC</td></tr><tr><td>-</td><td>-</td><td>4</td><td>2</td></tr></table>
Prerequisites	Basic knowledge about Java programming language.
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 Contents	1. Write a JAVA Servlet Program to implement a dynamic HTML using Servlet (user name and Password should be accepted using HTML and displayed using a Servlet). 2. Write a JAVA Servlet Program to Auto Web Page Refresh (Consider a webpage which is displaying Date and time or stock market status. For all such type of pages, you would need to refresh your web page regularly; Java Servlet makes this job easy by providing refresh automatically after a given interval). 3. Write a JAVA Servlet Program to implement and demonstrate get() and Post methods(Using HTTP Servlet Class). 4. Write a JAVA Servlet Program using cookies to remember user preferences. 5. Write a JAVA JSP Program to implement verification of a particular user login and display a Welcome page. 6. Write a JSP program to demonstrate the import attribute. 7. Write a JAVA JSP Program which uses jsp:include and jsp:forward action to display a Web page. 8. Write a JAVA JSP Program which uses tag to run a applet. 9. Write a JAVA JSP Program to get student information through a HTML and create a JAVA Bean class, populate Bean and display the same informationthrough another JSP. 10. Write a JAVA Program to insert data into Student DATA BASE and retrieve info based on particular queries(For example update, delete, search etc).. 11. Write a JSP program to implement all the attributes of page directive tag. 12. An EJB application that demonstrates Session Bean (with appropriate business logic).

Course Outcomes	1. Learn the Internet Programming, using Java Applets 2. 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 3. Apply event handling on AWT and Swing components. 4. A 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) 8. Understand the multi-tier architecture of web-based enterprise applications using Enterprise JavaBeans (EJB)
Text Books	1. Java the Complete Reference, ninth edition by Herbert Schild, Publisher: McGraw Hills 2. Head First EJB 3.0 by Kathy Sierra, Bert Bates, Publisher: O'Reilly Media 3. Head First Servlets and JSP by Bryan Basham, Kathy Sierra & Bert Bates, Publisher: O'Reilly Media.
Reference Books	1. Just Hibernate, A Lightweight Introduction to the Hibernate Framework by Madhusudhan Konda, Publisher: O'Reilly Media 2. Programming Jakarta Struts, 2nd Edition by Chuck Cavaness, Publisher: O'Reilly Media