SHIVAJI UNIVERSITY, KOLHAPUR

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Revised Syllabus and Structure of

(B.E. Computer Science & Engineering

Sem – VII & VIII)

To be introduced from the academic year 2016-17

(i.e. from June 2016) Onwards

(Subject to the modifications will be made from time to time)

SEMESTER VII

Course Code	Course	Teaching Scheme			Examination Scheme				
		L	P	T	Theory	TW	POE	OE	Total
CS7C01	Advanced Computer Architecture	4	-	1	100	25	-		125
CS7L02	Distributed Systems	3	2	-	100	25	-		125
CS7L03	Advanced Database Systems	3	2	-	100	25	-	50	175
CS7E04	Elective – I	3	-	1	100	25	-		125
CS7L05	Web Technologies – I	3	4	-	-	50	50		100
CS7L06	Project – I	-	4	-	-	75	-	75	150
	Total	**16**	**12**	**2**	**400**	**225**	**50**	**125**	**800**

SEMESTER VIII

Course Code	Course	Teaching Scheme			Examination Scheme				
		L	P	T	Theory	TW	POE	OE	Total
CS8C01	Data Analytics	4	2	-	100	25		50	175
CS8C02	Project Management	3	-	-	100	-		-	100
CS8C03	Real-time Operating System	4	-	1	100	25		-	125
CS8E04	Elective – II	3	-	1	100	25		-	125
CS8L05	Web Technologies – II	2	4	-	-	50	50	-	100
CS8L06	Project – II	-	4	-	-	75		75	150
CS8L07	Community Services	-	2	-	-	25		-	25
	Total	**16**	**12**	**2**	**400**	**225**	**50**	**125**	**800**

Elective –I

A. Soft Computing
B. Mobile Applications
C. Adhoc Wireless Networks

Elective –II

A. Internet of Things
B. Software Testing and Quality Assurance
C. Introduction to Mainframes

Note:

1. The term work as prescribed in the syllabus is to be periodically and jointly assessed by a team of teachers from the concerned department.
2. In case of tutorials, students of different batches be assigned problems of different types and be guided for the solution of the problem during tutorial session. Problems thus solved be translated into computer programs wherever applicable and executed by respective batches during practical session.
3. The assignments of tutorials and practicals need to be submitted in the form of soft copy and / or written journal.
4. The Term Work (TW) Assessment be done based on the performance of the student in the Class Tests, Timely submission of Tutorials/Assignments, Practical Performance during the entire semester etc.
5. Project work should be continually evaluated based on:
    a. The contributions of the group members, originality of the work, innovations brought in, research and developmental efforts, depth and applicability, etc.
    b. Two mid-term evaluations should be done, which includes presentations and demos of the work done.
6. In addition to the above list of electives, any other elective based on the current developments and need may be offered with prior sanction from the University Authorities.
7. The elective should be offered by the department, if the minimum number of students opting for a particular elective must be 15 students and it should be taught by the concerned teacher.

B.E. (COMPUTER SCIENCE & ENGINEERING) Sem – VII

CS7C01. ADVANCED COMPUTER ARCHITECTURE

Lecture	: 4 hrs / week	**Theory**	: 100 Marks
Tutorials	: 1 hr/ week	**Term work**	: 25 Marks

Pre-requisite: Digital systems and microprocessors, computer organization and architectures.

Objectives:

1. To understand different computer architectures
2. To learn concepts of pipeline architectures and different performance measures
3. To understand memory organizations
4. To understand latest technologies in parallel processing
5. To understand loosely coupled architectures

Section - I

Unit 1. Introduction **(6)**

State of computing, Multiprocessor and Multicomputer, Multivector and SIMD Computers, Architectural development tracks, Trends in Power and Energy in Integrated Circuits, Trends in Cost, Dependability Measuring.

Unit 2. Principles of Pipelining and Vector Processing: **(6)**

Pipelining, linear pipelining, classification of Pipeline Processors, Interleaved memory organizations, performance evaluation factors.. Vector processing concepts, characteristics, pipelined vector processors, Cray type vector processor - design e.g. Array processors, Systolic arrays.

Unit 3. Different parallel processing architectures: **(6)**

Introduction to Associative memory processors, Multithreaded architecture –principles of multithreading, Latency hiding techniques, Scalable coherent multiprocessor model with distributed shared memory.

Section - II

Unit 4. Distributed Memory Architecture : **(6)**

Loosely coupled and tightly coupled architectures. Cluster computing as an application of loosely coupled architecture. Examples – CM* and Hadoop.

Unit 5. Data-Level Parallelism in Vector, SIMD and GPU Architectures **(6)**

Introduction, Vector Architecture, SIMD Instruction Set Extensions for Multimedia, Graphics Processing Units Detecting and Enhancing Loop-Level Parallelism, Crosscutting Issues Mobile versus Server GPUs and Tesla versus Core i7.

(6)

Unit 6. Program and Network Properties:
Conditions of parallelism Data and Resource Dependences, Data dependency analysis - Bernstein's condition, Hardware and Software Parallelism. , Grain Sizes and Latency, Grain Packing and Scheduling.

Text Books:

1. Advanced computer architecture – Kai Hwang (MGH). (for Unit 1, 3 & 6)
2. Computer Architecture & Parallel Processing – Kai Hwang & Briggs (MGH) (for Unit 2 & 4)
3. Computer Architecture - A Quantitative Approach, 5th Edition, John L. Hennessy and David A. Patterson, Elsevier. (For Unit 5 & 1)

Reference Books:

1. Advanced computer Architecture – Dezso Sima, Terence Fountain & Peter Kacsuk (Pearson Education)
2. Parallel Programming Techniques & Applications using Networked Workstations & Parallel Computers - Barry Wilkinson & Michael Allen–Second Edition (Pearson Education).
3. Advanced Computer Architecture , Kai Hwang & Naresh Jotwani, 2nd edition , McGraw Hill Publications.

Term Work: It should consist of minimum 8-10 assignments with emphasis on solving exercise problems

CS7L02. DISTRIBUTED SYSTEMS

Lecture	: 3 hrs / week	**Theory**	: 100 Marks
Practical	: 2 hrs/ week	**Term work**	: 25 Marks

Objectives:

1. To present the principles underlying the function of distributed systems and their extension to grid and cloud computing and virtualization techniques

2. To expose students to current technology used to build architectures to enhance distributed computing infrastructures with various computing principles and paradigms, including grid and cloud computing

3. Expose students to past and current research issues in the field of distributed systems and new challenges in cloud computing

4. Enhance students understanding of key issues related to multi-level interoperability across a distributed infrastructure and across multiple heterogeneous and distributed resources in a dynamically changing computing environment

Section I

UNIT 1: Introduction **05**

Definition, Goals, Types of distributed systems: Distributed Computing System, Distributed Information System, Architecture: Architectural, Styles, System Architecture

UNIT 2: Processes and Communication **08**

Remote Procedure Call, Message Oriented Transient Communication, Physical Clock Synchronization, Logical Clock, Mutual exclusion, Election Algorithms

UNIT 3: Distributed File Systems and Fault Tolerance **09**

Architecture, Processes, Communication, Naming, Synchronization, Consistency and Replication, Introduction to fault tolerance, Process Resilience, Distributed Commit, Recovery.

Section II

UNIT 4: Introduction to Cloud **04**

Getting to know the Cloud, Cloud and other similar configurations, Components of Cloud Computing, Cloud Types and Models: Private Cloud**,** Community Cloud, Public Cloud, Hybrid Clouds.

UNIT 5: Virtualization **05**

Introduction and benefits, Implementation Levels of Virtualization, Virtualization at the OS Level, Virtualization Structure, Virtualization Mechanism, Open Source Virtualization Technology, Xen Virtualization Architecture, Binary Translation with Full Virtualization, Paravirtualization, Virtualization of CPU, Memory and I/O Devices.

UNIT 6: Cloud Computing Services and Data Security in Cloud **08**

Infrastructure as a Service, Platform as a Service, Software as a Service, Database as a Service , Specialized Cloud Services, Challenges with Cloud Data, Challenges with Data Security, Data Confidentiality and Encryption, Data availability, Data Integrity, Cloud Storage Gateways.

Text Books:

1. Distributed Systems: Principles and Paradigms- Tanenbaum, Steen.
2. Cloud Computing Black Book- Jayaswal, Kallakurchi, Houde, Shah, Dreamtech Press.

Reference Books:

1. Cloud Computing: Principles and Paradigms – Buyya, Broburg, Goscinski.
2. Cloud Computing for Dummies – Judith Hurwitz.

List of experiments:

1. Study / Configuring P2P clients
2. RPC
3. Configuring the Client/Server for NTP
4. Simulation of Mutual Exclusion Algorithms
5. Simulation of Election algorithms
6. Client/Server Configuration of NFS
7. Auto mounting in NFS
8. Simulation of Distributed Commit
9. Simulation of recovery techniques
10. Installing a private cloud
11. Installing OS on a Virtual Machine Monitor
12. Offline migration of virtual OS
13. Live migration of virtual OS
14. Developing application on Google AppEngine

(Minimum 4 experiments from Section-I and 4 from Section-II should be framed based on the above list)

CS7L03. ADVANCED DATABASE SYSTEMS

Lecture	: 3 hrs / week	**Theory**	: 100 Marks
Practical	: 2 hrs/ week	**Term work**	: 25 Marks
		OE	: 50 Marks

Objectives:

1. To learn Basics of design of databases.
2. To acquire knowledge on parallel and distributed databases and its applications.
3. To study the usage and applications of Object Oriented database.
4. To Understand and perform common database administration tasks, such as database monitoring, performance tuning, data transfer, and security.
5. To understand the usage of advanced data models.

Section - I

Unit I: Parallel and Distributed Databases (7)

Database System Architectures: Centralized and Client – Server Architectures – Server System Architectures – Parallel Systems – Distributed Systems – Parallel Databases: I/O Parallelism – Inter and Intra Query Parallelism – Inter and Intra operation Parallelism – Design of Parallel Systems – Distributed Database Concepts - Distributed Data Storage – Distributed Transactions – Commit Protocols – Concurrency Control – Distributed Query Processing – Case Studies.

Unit II: Object And Object Relational Databases (7)

Concepts for Object Databases: Object Identity – Object structure – Type Constructors – Encapsulation of Operations – Methods – Persistence – Type and Class Hierarchies – Inheritance – Complex Objects – Object Database Standards, Languages and Design: ODMG Model – ODL – OQL – Object Relational and Extended – Relational Systems: Object Relational features in SQL – Case Studies.

Unit III : Advanced SQL (7)

PL SQL- A Basic introduction, Functions and Procedure, Packages, Synonyms, Database Links, Embedded SQL and Dynamic SQL. Database Design: systems development life cycle, database life cycle, DBMS Software Selection, top-down versus bottom-up design, centralized versus decentralized design.

Section - II

Unit IV: Database Security and Authorization (5)

Discretionary Access Control, Mandatory Access Control, Audit Trails in Databases, Statistical Databases

Unit V: Databases on the Web and Semi-structured data (5)

Overview of XML, structure of XML data, document schema, querying XML data, storage of XML data, XML applications, the semi-structure data model, implementation issues, indexes for text data.

Unit VI: Business Intelligence and Data Warehouses (5)

The Need for Data Analysis, Business Intelligence, Business Intelligence Architecture, Decision Support Data, Online Analytical Processing, Star Schemas, Implementing a Warehouse, Data Mining, SQL Extension for OLAP.

Course Outcomes: After the completion of the course the student will,

1. Critically analyze and evaluate modeling and development methods/techniques in Object-Relational Databases.
2. Get good knowledge of abstract data types, type constructors and know the scope.
3. Get good knowledge on the need, issues, design and application of both parallel and distributed databases.
4. Be able to fragment, replicate and localize their data as well as their queries to get their work done faster.
5. Critically compare, analyze and evaluate methods/technologies in developing data warehouses
6. Aspire to improve the performance of a database. Evaluate various mining techniques on complex data objects.

Text Books:

1. Database System Concepts – Silberschatz, Korth, Sudarshan – 5th Edi (MGH International edition).
2. Fundamentals of Database Systems - Elmasri and Navathe [4e], Pearson Education
3. Database Systems, Design, Implementation and Management - Coronel-Morris- Rob

References:

1. Database Management System – Raghu Ramkrishnan, Johannes Gehrke, Database Management Systems[3e], (MGH).
2. Advanced Database Management System – Rini Chakrabarti -Shilbhadra Dasgupta.

Term Work:

It should consist of minimum 8-10 assignments, based on the syllabus and below mentioned experiment list.

1. To develop and write SQL queries for a distributed database of Bookstore at four sites S1, S2, S3 and S4. The Bookstores are divided into four sites by their ZIP codes.
2. Deadlock Detection Algorithm For Distributed Database Using Wait For Graph.
3. Implement Partitioning on the tables.
4. Implement semi join in distributed DBMS.
5. Implement bloom join in Distributed DBMS.
6. Implement two phase commit in distributed DBMS.
7. Develop an application using multi-valued Attributes, complex types, procedure, function and Inheritance in ORDBMS.
8. Demonstration of Active Database.
9. Implementation of Synonyms and Sequence.

10. Implementation of XML commands.
11. Designing XML Schema for Company Database using Xpath and Xquery.
12. Implement K-Means Data Mining Clustering Algorithm.
13. Implement a priori algorithm.
14. Implementation of OLAP queries.
15. Implementation of cube operator in OLAP queries in data warehousing and decision support system.
16. Implement view modification and materialization in data warehousing and decision support systems.

CS7E04. ELECTIVE – I A) Soft Computing

Lecture : 3 hrs / week
Tutorials : 1 hr/ week

Theory : 100 Marks
Term work : 25 Marks

Course Objectives:
Students will be able to,
1. Explain the fuzzy set theory.
2. Comprehend neuro fuzzy modeling
3. Apply derivative based and derivative free optimization
4. Demonstrate some applications of computational intelligence

Section - I

Unit1: Introduction: Artificial Neural Network, Advantages of Neural Network, Fuzzy Logic, Genetic Algorithms, Hybrid Systems: Neuro Fuzzy Hybrid System, Neuro Genetic Hybrid System, Fuzzy Genetic
Hybrid System. **(4)**

Unit 2. Artificial Neural Networks: Fundamental Concept, Evolution of Neural Networks, Basic Models of Artificial Neural Network, Terminologies of ANNs, McCulloch-Pitts Neuron, Linear Reparability,
Hebb Network. **(7)**

Unit 3. Supervised Learning Network: Perceptron Networks, Adaptive Linear Neuron (Adaline) ,Mutiple
Adaptive Linear Neuron, Back Propagation Network, Radial Basis Function Network. **(7)**

Section - II

Unit 4. Introduction to Fuzzy Sets : Introduction, Classical Sets, Fuzzy Sets, Fuzzy relations, Membership Function, Defuzzification, Fuzzy Arithmetic and Fuzzy Measures, Fuzzy Rule base and Approximate
Reasoning, Fuzzy Decision Making, Fuzzy Logic Control System. **(7)**

Unit 5. Genetic Algorithms : Introduction , Basic Operators and Terminologies in Gas, Traditional Algorithm vs. Genetic Algorithms , Simple GA, General Genetic Algorithm, The Schema Theorem, Classification of Genetic Algorithm, Holland Classifier System, Genetic Programming, Applications of GA. **(7)**

Unit 6. Applications of Soft Computing: GA Based Internet Search Technique; Soft Computing Based Hybrid Fuzzy Controllers. **(4)**

Text Books:

1) Principles of Soft Computing - S.N. Sivanandam , S.N. Deepa. (Wiley India Edition).

2) Elements of Artificial Neural Networks - K. Mehrotra, C.K. Mohan, and S. Ranka Published by MIT Press, 1997)

Reference Books:

1. Soft Computing and Intelligent Systems Design – theory, tools and applications – F.O. Karray & C.D. Silva (Pearson Education).

2. Neuro-Fuzzy and Soft Computing – A computational approach to learning and machine intelligence – J.S.R. Jang, C.T. Sun & E. Mizutani (Pearson Education).

Term Work: It should consist of minimum 10-12 assignments including problem solving assignments based on Neural Networks and Fuzzy Logic as given the syllabus.

CS7E04. ELECTIVE – I B) Mobile Applications

Lecture : 3 hrs / week
Tutorials : 1 hr/ week
Theory : 100 Marks
Term work : 25 Marks

Course Objectives:

1. To develop problem solving abilities using Mobile Applications
2. To study mobile programming technology.

Course Outcomes:

1. To write a survey on tools and architectures for Mobile Applications.
2. To write using mathematical models the problem solutions using Mobile Applications.
3. To write develop mobile applications using open source tools.

Section - I

Unit 1: Introduction (6)

Mobile Development Importance, Survey of mobile based application development, Mobile myths, Third party frameworks, Mobile Web Presence and Applications, Creating consumable web services for mobile, JSON, Debugging Web Services, Mobile Web Sites, Starting with Android mobile Applications.

Unit 2: Mobile Web (6)

Introduction, WAP1, WAP2, Fragmentation Display, Input Methods, Browsers and Web Platforms, Tools for Mobile Web Development.

Unit 3: Application Architectures and Designs (8)

Mobile Strategy, Navigation, Design and User Experience, WML, XHTML Mobile Profile and Basics, Mobile HTML5, CSS for Mobile, WCSS extensions, CSS3, CSS for mobile browsers, HTML5 Compatibility levels, Basics of Mobile HTML5: Document Head, Document Body, HTML5 Mobile Boilerplate, the Content, HTML5 Forms: Design, Elements, Attributes, validation.

Section - II

Unit 4 : Devices, Images, Multi-Media (6)

Device Detection, Client-side Detection, Server-side Detection, Device Interaction, Images, Video, Audio, Debugging and Performance, Content Delivery, Native and Installed Web Apps.

Unit 5: Advanced Tools, Techniques (8)

J2ME programming basics, HTML5 Script Extensions,Code Execution, Cloud based browsers, JS Debugging and profiling, Background Execution, Supported Technologies and API,Standard JavaScript Behavior, Java Libraries, Mobile Libraries, UI Frameworks: Sencha Touch, JQueryMobile, Enyo, Montage, iUI, jQTouch, JavaScript Mobile UI Patterns.

Unit 6: Advanced Applications (6)

Geolocation and Maps APP, Offline Apps, Storage, and Networks, Distribution and Social Web 2.0

Text Books:

1. Jeff McWherter, Scott Gowell, Professional Mobile Application Development, John Wiley & Sons, Ref: www.it-ebooks.org
2. Maximiliano Firtman, Programming the mobile Web, Oreilly, 2nd Edition, 2013, ISBN: 978-1-449-33497-0

Reference Books:

1. Digital Content: http://en.wikibooks.org/wiki/Category: J2ME Programming

2. Android Studio Development Essentials, ref: http://www.techotopia.com/

CS7E04. ELECTIVE – I C) Adhoc Wireless Networks

Lecture : 3 hrs / week **Theory** : 100 Marks
Tutorials : 1 hr/ week **Term work** : 25 Marks

Course Objectives:-

To expose students to:

1. Adhoc wireless networks, their unique applications and design issues.
2. How Adhoc N/w works at MAC layer, forwarding mechanism and link recovery strategies.
3. Diffrent routing mechanisms in Adhoc N/w, finding path from source node to destination node, recovery of routes.
4. Forming multicast sessions in Adhoc N/w, efficiently using resources available in networks.
5. Modification in traditional TCP protocol to make it best suitable for Adhoc Wireless Network.
6. Security issues in Adhoc N/w and strategies to overcome these issues.
7. Strategies for providing QoS in Adhoc N/w and dealing with power management issues to effectively use energy in Adhoc N/w.

Section - I

Unit 1. Introduction to Ad-hoc wireless networks: (3)

Cellular and Ad Hoc wireless networks, Applications, Issues in Ad Hoc wireless networks.

Unit 2. MAC Protocols for Ad-hoc wireless networks: (6)

Introduction, Issues in designing MAC protocol, Design goals of MAC protocol, Classification of MAC protocols, Contention based protocols :- MACAW, Busy Tone Multiple Access, MACA-By Invitation, Media Access with Reduced Handshake.

Unit 3. Routing protocols for Ad-hoc wireless networks (8)

Introduction, Issues in designing a routing protocol for ad hoc wireless networks, Classification of routing protocols, Table driven protocols :- DSDV, WRP, CGSR; On-Demand Hybrid routing protocols:- DSR, AODV, LAR, ABR, SSA , ZRP, ZHLS.

Section - II

Unit 4. Multicast Routing in Ad hoc wireless networks (8)

Introduction, Issues in designing a multicast routing protocol, Operation of multicast routing protocols, An architecture reference model for multicast routing protocols, Classification of multicast routing protocols, Tree-based Multicast Routing Protocols:- BEMR, MZRP, ABAM, PLBM, MAODV ; Mesh-based multicast routing protocols:- NSMP, CAMP.

Unit 5. Transport layer and security protocols for ad hoc wireless networks (8)

Introduction, Design issues and goals, Classification of transport layer solutions, TCP over ad hoc wireless networks:- TCP-F,Ad Hoc TCP, Split TCP; Security in ad hoc wireless networks:-

, Network security requirements, Issues and challenges in security provisioning, Network security attacks, Secure routing protocol - SAR, Security-Aware AODV Protocol.

Unit 6. Quality of service **(3)**

Introduction, Issues and challenges, Classification of QoS colutions, QoS framework – INSIGNIA, INORA, SWAN.

Unit 7. Energy management **(2)**

Introduction, Need, Classification of energy management schemes, System Power Management schemes- Processor Power Management Scheme, Device Power Management Scheme**.**

Text Books:

1. Ad Hoc wireless Networks – Architecture and Protocols by C.S.R.Murthy & B.S. Manoj, Pearson Education.

Reference Books:

1. Ad Hoc Wireless Networks – A communication Theoretic perspective by O.K.Tonguz & G.Ferrari, Wiley India.2. Ad Hoc Mobile Wireless Networks – Protocols and Systems by C. K. Toh (PearsonEducation)

3. Ad Hoc Networking by Charles E. Perkins (Pearson Education)

4. Introduction to Wireless and Mobile Systems, 2 nd Edition, by Dharma Prakash Agrawal & Qing-An Zeng (CENGAGE Learning)

5. Mobile AD HOC Networking, Student Edition; by Stefano Basagni, Marco Conti, Silvia Giordano, Ivan Stojmenovic

6. The Handbook Of Ad Hoc Wireless Networks By Mohammad Ilyas Florida Atlantic University Boca Raton, Florida.(for Network Simulation Tool)

Term Work:

It should consist of minimum 8-10 assignments based on the above topics. NS-2/3 should be used to simulate MAC, Routing and Multicast routing protocols.

CS7L05. WEB TECHNOLOGIES - I

Lecture : 3 hrs / week
Practical : 4 hrs/ week

Term work : 50 Marks
POE : 50 Marks

Prerequisites:

1. Programming Lab - III

Course Objectives:

1. Introduce students to emerging web technologies
2. Introduce students with front end web designing
3. Introduce students with XML concepts and its applications
4. Motivate the students to develop web applications using Servlets and JSP

Section - I

Unit 1: Front End Web Designing (8)

HTML Design Patterns: HTML Structure, XHTML, DOCTYPE, Header Elements, Conditional Style Sheet, Structural Block Elements, Terminal Block Elements, Multipurpose Block Elements, Inline Elements, Class and ID Attributes, HTML Whitespaces

CSS Selector and Inheritance: Type, Class and ID Selector, Position and Group Selectors, Attribute Selectors, Pseudo-element Selectors, Pseudo-class Selectors, Subclass Selector, Inheritance, Visual Inheritance

Box Model : Display, Box Model, Inline Box, Inline-Block Box, Block Box, Table Box, Absolute Box, Floated Box, Box Extends: Width, Height, Sized, Shrink, wrapped, Stretched, Box Margin, Border, Padding, Background, Overflow, Visibility, Page Break Positioning Models, Closest Positioned Ancestor, Stacking Context, Atomic, Static, Absolute, Fixed Relative, Float and Clear, Relative Float

Unit 2: Introduction to XML (6)

Basics of XML: The benefits of XML, What XML Is Not, Portable Data, How XML Works, The Evolution of XML, XML Documents and XML Files, Elements, Tags and Character Data, Attributes, XML Names, References, CDATA Sections, Comments, Processing Instructions, The XML Declaration, Checking Documents for Well-Formedness

DTD and Namespaces: Validation, Element Declarations, Attribute Declaration, General Entity Declarations, External Parsed General Entities, External Unparsed Entities and Notations, Parameter Entities, Conditional Inclusion, Two DTD Example, Locating Standard DTD, The need for namespaces, Namespace Syntax, How Parsers Handle Namespaces, Namespaces and DTDs

Unit 3: Working with XML (8)

XML Transformations : An Example Input Document, xsl:stylesheet and xsl:transform, Stylesheet Processors, Templates and Template Rules, Calculating the value of an Element with xsl:value-of, Applying Templates with xsl:apply-templates, The Built-in Template Rules, Modes, Attribute Value Templates, XSLT and Namespaces, Other XSLT Elements

XPath : The Tree Structure of an XML Document, Location Paths, Compound Location Paths, Predicates, Unabbreviated Location Paths, General Xpath Expressions, Xpath Functions

Processing Models : Common XML Processing Models, Common XML Processing Issues, Generating XML Documents Document Object Model (DOM), DOM Foundations, Structure of DOM Core, Node and Other Generic Interfaces, Specific Node-Type Interfaces, The DOM Implementation Interface, DOM Level 3 Interfaces, Parsing a Document with DOM, A Simple DOM Application Simple API for XML (SAX), The ContentHandler Interface, Features and Properties, Filters

Section - II

Unit 4: Basics of Servelets (6)

Introduction to Servlet : History of Web Application, Support for Servlets, The power of Servlets, HTTP Basics, The Servlet API, Page Generation, Server-Side Includes, Servlet Chaining and Filters, Java Server Pages

The servlet Lifecycle : The Servlet Alternative, Servlet Reloading, Init and Destroy, Single-Thread Model, Background Processing, Last Modified Time

Retrieving Information and Sending Information: Initialization Parameters, The server, The Client, The Request. The Structure of Response, Using Persistence Connection, HTML Generation, Status Codes, HTTP Headers

Unit 5: Advanced Topics in Servlet (4)

Session Tracking : User Authorization, Hidden Form Fields, URL Rewriting, Persistent Cookies, The session Tracking API

Database Connectivity : Relational Database, The JDBC API, Reusing Database Objects, Transaction, Advanced JDBC Techniques

Unit 6: Java Server Pages (JSP) (8)

Understanding the need for JSP, Evaluating benefits of JSP, Comparing JSP to other technologies, Installing JSP Pages, Creating Template Text, Invoking Java Code from JSP, Limiting the amount of Java Code in JSP, Using JSP Expression, JSP Expression, Example of JSP Expression, Writing Scriplets, Scriplet examples, Scriplets for conditional execution, Using Declaration, Declaration Example, using Predefined Variables, Including Pages at Request Time: The jsp:include Action, Including Files at Page Translation Time: The include Directive, Forwarding Requests with jsp:forward, The jsp:param and jsp:params Element, The jsp:fallback Element

Text Books:

1. Pro HTML5 and CSS3 Design Patterns by Michael Bowers, Dionysios Synodinos and Victor Sumner, Apress edition
2. XML in a Nutshell by Elliotte RustyHarold, W. Scott Means O'Reilly Publication, 3rd Edition
3. Java Servlet Programming by Jason Hunter, O'Reilly Publication, 1st Edition
4. Core-Servlet and JavaServer Pages Volume – 1, by Marty Hall, Larry Brown, Pearson Education 2nd Edition

Reference Books:

1. Head First Servlets and JSP: Passing the Sun Certified Web Component Developer Exam - 2nd Edition-Bryan Basham, Kathy Sierra, Bert Bates- O'REILLY.

Term Work:

Term work marks is based on regular practical performance and final internal practical oral examination as well**.**

Sample Experiment List:

It should consist of 15-20 experiments based on the following topics.

1. Create html pages for website like login, registration and about us pages.
2. Design created pages using CSS
3. Create different types of valid XML documents
4. Search information from XML document using SAX parser
5. Navigating the Document Object Model tree for given XML Document
6. Creating XML document using DOM
7. Write XSLT styles-sheet to convert XML document to HTML
8. XML Validation using XSchema
9. Remote Procedure call using XML
10. Installation, Configuration of Tomcat Server and Deployment of Servlet based application
11. Write a servlet to store form data to database – use Type 4 JDBC driver
12. Write a servlet to search data from database
13. Session Management using Servlet
14. Write a JSP application to display database contents
15. Write a servlet to search data from database. Write a JSP application to input book information and store in the database. Application must provide facility to search book based on title of book, and author
16. Write a JSP application to input student information like first name, last name, department, date of birth, class, marks obtained in five subjects and store this information into database. Also generate report showing aggregate marks of all the students.
17. Write a JSP application to demonstrate Session Management using JSP (Application Controlled Authentication)

CS7L06. PROJECT - I

Practical : 4 hrs/ week

Term work : 75 Marks
OE : 75 Marks

The project work is to be carried out in two semesters of B.E. The project should be undertaken preferably by group of 4-5 students who will jointly work and implement the project in the two semesters.

In Semester VII, The group will select a project with the approval of the Guide (teaching staff) and submit the name of the project with a synopsis of the proposed work of not more than 02 to 08 pages before second week of August in the academic year. The group is expected to complete detailed system design, analysis, data flow design, procurement of hardware and/or software, implementation of a few modules of the proposed work at the end of semester –VII as a part of the term work submission in the form of a joint report. The term work assessment will be done jointly by teachers appointed by Head of the Department.

The oral examination will be conducted by an internal and external examiner as appointed by the University.

Note:

1. Project work should be continually evaluated based on the contributions of the group members, originality of the work, innovations brought in, research and developmental efforts, depth and applicability, etc.
2. Two mid-term evaluations should be done, which includes presentations and demos of the work done.
3. *Care should be taken to avoid copying and outsourcing of the project work.*