

SHIVAJI UNIVERSITY, KOLHAPUR

"A"

Accredited by NAAC

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 practical's 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 **(8)**

State of computing, Multiprocessor and Multicomputer, 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: **(8)**

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: **(8)**

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*.

Unit 5. Data-Level Parallelism in Vector, SIMD and GPU Architectures **(8)**

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.

Unit 6. Program and Network Properties: **(8)**

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 **(5)**

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

UNIT 2: Communication and Synchronization : (8)

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

UNIT 3: Distributed File Systems and Fault Tolerance (8)

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

Section II

UNIT 4: Introduction to Cloud (4)

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 (5)

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 (6)

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.

Text Books:

1. Database System Concepts – Silberschatz, Korth, Sudarshan – 5th Edi (MGH International edition). (Unit No.1,Unit No.5,Unit No.2)
2. Fundamentals of Database Systems - Elmasri and Navathe [4e], Pearson Education (Unit No.2)
3. Database Systems, Design, Implementation and Management - Coronel-Morris- Rob

(Unit No.3,4,6)

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:

1. To earn fuzzy set theory and properties of Fuzzy sets.
2. To learn Neuro -Fuzzy modeling concepts
3. To learn Neural networks and training algorithms
3. To apply derivative based and derivative free optimization
4. To demonstrate 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.

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 different Mobile OS
3. To study procedure to develop applications using Mobile OS.
2. To study practical applications of Mobile.

Section - I

Unit 1: Introduction **(5)**

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 **(6)**

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 **(5)**

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/

Term Work: It should consist of minimum 10-12 assignments based on latest Web Technologies and Mobile operating systems.

CS7E04. ELECTIVE – I C) Adhoc Wireless Networks

Lecture : 3 hrs / week
Tutorials : 1 hr/ week
Theory : 100 Marks
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 (6)

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.Energy Management and Quality of service (5)

Introduction, Need, Classification of energy management schemes, System Power Management schemes- Processor Power Management Scheme, Device Power Management Scheme**.**Issues and challenges, Classification of QoS colutions, QoS framework – INSIGNIA, INORA, SWAN.

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 and some assignments should be on NS-2/3 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

Course Objectives:

1. To introduce students to emerging web technologies
2. To teach front end web designing tools and to develop web applications
3. To know XML concepts and its applications

4. To motivate students to develop web applications using Servlets and JSP

Section - I

Unit 1: Front End Web Designing (7)

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 (7)

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) **(6)**

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.*

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

CSC801. DATA ANALYTICS

Lecture	: 4 hrs / week	**Theory**	: 100 Marks
Practical	: 2 hrs/ week	**Termwork**	: 25 Marks
		OE	: 50 Marks

Objectives:

1. To understand Business Intelligence, decision support systems in Data warehouse
2. To study the Data analysis using data mining, data preparation and exploration
3. To forester the development of data mining capability in Hadoop and R and facilitate sharing of data mining codes/functions/algorithms among Hadoop and R users.

Section-I

Unit 1: Components of Decision-making process (8)

Business intelligence, Decision Support Systems, Data ware-housing.

Unit 2: Data analysis and exploration (8)

Mathematical models for decision making, data mining, data preparation, data exploration.

Unit 3: Introduction of Big data and Hadoop Echosystem (8)

Big data definition, Elements of Big data, Big data analytics, Big Data Stack, Virtualization and Big data, virtualization approaches, Hadoop Ecosystem, Hadoop Distributed file system(HDFS, MapReduce, Hadoop YARN, Hbase, Hive, Pig and Pig latin, Sqoop, ZooKeeper, Flume, Oozie.

Section-II

Unit 4: Data mining tasks (8)

Regression and association rules- structure of regression model, single linear regression, and multiple linear regression.

Classification - classification problems, Classification models, classification trees, Bayesian methods.

Unit 5: Association rules and clustering (8)

Structure of association rules, Single dimension association rules, Apriori algorithm, General association rules. **Clustering –** clustering methods, partition methods, Hierarchical methods.

Unit 6: Exploring R (8)

Basic Features of R, Exploring RGui, Working with vectors, Handeling data in R workspace. Reading datasets and exporting data from R, Manipulating and processing data in R.

Text Books:

1. Business Intelligence - Data Mining and optimization for Decision Making- Carlo Vercellis- Wiley Publications. (For Units 1, 2, 4, 5)

2. Big Data and Analytics- Seema Acharya and Subhashini Chellappan- Wiley Publications.

3. Big Data (Black Book)- DT Editorial Services- Dreamtech Press (For Units 3, 6)

4. Data mining Introductory and Advanced topics- Margaret H. Dunham-Pearson (For Units 4, 5)

Reference Books :

1. Data Mining: Concepts and Techniques Second Edition- Jiawei Han and Micheline Kamber- Morgan KaufMan Publisher.

2. Data mining and Analysis Fundamental Concepts and Algorithms - Mohammed J. Zaki and Wagner Meira Jr. - Cambridge University Press.

List of Experiments:

1. Installation of Hadoop and R.
2. Building Hadoop MapReduce application for counting frequency of word/phrase in simple text file.
3. Study of Hadoop YARN Administration command and User commands.
4. Study of Hadoop Hive DDL commands, like create database, Viewing database, Dropping database, Altering database, creating tables, Dropping and altering tables.
5. Study of Hadoop Hive DML commands like Insert, delete, update, data retrieval queries and Join-inner and outer.
6. Working with operators in Pig- FOREACH, ASSERT, FILTER, GROUP, ORDER BY, DISTINCT, JOIN, LIMIT, SAMPE, SPLIT, FLATIEN.
7. Study of R-declaring variables, expressions, functions and executing R script.
8. Working with R with data sets- create, read, write and R Tables- create, read, write.
9. Manipulating and processing data in R- merging datasets, sorting data, putting data into shape, managing data using matrices managing data using data frames.

CS8C02. PROJECT MANAGEMENT

Lecture : 3 hrs / week **Theory** : 100 Marks

Objectives:

1. To provide students with a basic understanding of project management principles and practices.
2. To demonstrate competency in the creation and management of a project plan
3. To understanding impact of Scope, Time and Cost management.
4. To understanding the software quality metrics and quality assurance.
5. To develop strategies to calculate risk factors involved in IT projects

Section - I

Unit 1. Introduction to Project Management: (5)

Project and Project Management (PM), Role of project Manager, System view of PM, Organization, Stakeholders, Project phases and lifecycle, Context of IT projects, process groups, mapping groups to Knowledge areas

Unit 2. Project Integration Management: (5)

Strategic planning and project selection, Developing a Project Management Plan, Directing and Managing Project Work, Monitoring and Controlling Project Work, Performing Integrated Change Control, Closing Projects or Phases

Unit 3. Project Scope, Time and Cost management: (9)

Planning Scope Management, Collecting Requirements, Defining Scope, Creating the Work Breakdown Structure, Validating Scope, Controlling Scope

Planning Schedule Management, Defining Activities, Sequencing and Estimating Activity, Resources & Duration, Developing & Controlling Schedule

Basic Principles of Cost Management, Planning Cost Management, Estimating Costs, Determining the Budget, Controlling Costs

Section - II

Unit 4. Quality Management: (6)

Importance, Planning Quality Management, Performing Quality Assurance, Controlling Quality, Tools and Techniques for Quality Control, Modern Quality Management, Improving IT Project Quality

Unit 5. Human Resource management: (6)

Importance, keys to managing people, human resource planning, acquiring, developing and managing project team, software assistance.

Unit 6. Risk management: (5)

Importance, risk management planning, sources of risk, risk identification, qualitative and quantitative risk analysis, risk response planning, risk monitoring and control.

Text Book:

1. Information Technology Project Management, 7E, Kathy Schwalbe, Cengage Learning (India Edition)

Reference Books:

1. IT Project Management, 3 E, Joseph Phillips, McGraw Hill Edu. (India) Pvt. Ltd.

2. Software Project Management, Bob Huges, Mike Cotterell, Rajib Mall, 5/E, Tata McGraw Hill Edu. (India) Pvt. Ltd.
3. Project Management Core Textbook – Mantel Jr., Meredith, Shafer, Sutton, Gopalan (Wiley India Edition).
4. A Guide to the Project Management Body of Knowledge (PMBOK) (5th –Edition) – Newtown Square, PA, Project Management Institute (PMI).

[NOTE: PM Software Platforms such as Microsoft Project Management, JIRA should be introduced to students]

CS8C03. REAL TIME OPERATING SYSTEM

Lecture : 4 hrs / week
Tutorial : 1 hr/ week
Theory : 100 Marks
Termwork : 25 Marks

Objectives:

1. To understand basic real time operating system concepts.
2. To understand software engineering process for real time system design.
3. To learn programming languages for programming real time systems.
4. To understand different performance measures for real time O.S.
5. To understand different features of commercial real time operating systems.

Section - I

Unit 1. Basic Real Time Concepts & Hardware Considerations (3)

Terminology, Real Time System Design issues, Examples of Real-Time Systems

Unit 2. Hardware Considerations (5)

Basic Architecture, Hardware Interfacing, Central Processing Unit, Memory, Input / Output, Other special devices

Unit 3. Real-Time Operating System (10)

Real-Time Kernels, Theoretical Foundation of Real-Time Operating System, Scheduling ,Inter Task Communication and synchronization, System Services for Application Programs, Memory Management, Selecting Real Time Operating Systems ,Case study : POSIX .

Section - II

Unit 4. Software Requirements Engineering (8)

Requirements - Engineering process, Types of Requirements, Requirements Specification for Real-Time Systems, Formal Methods in Software Specification, Structured Analysis and Design, Object-Oriented Analysis and the Unified Modeling, Organizing the Requirements Document, Organizing and Writing Requirements, Requirements Validation and Review.

UNIT 4. **Programming Language and the Software Production Process** **(8)**
Coding of Real Time Software, Assembly Language, Procedural Language, Object-Oriented Language,. Overview of programming languages for real time systems. Real time features of JAVA, C# languages, Special Real Time Languages, Compiler Optimization of code.

UNIT 5 **Metrics & Cost Estimation** **(8)**

Lines of Code, McCabe's Metric ,Halstead's Metric ,Function points, Feature Points , Metric for Object –Oriented Software. Fault Tolerance ,Cost Estimation using COCOMO , Basic COCOMO, Detailed COCOMO, COCOMO II model .

Unit 6. Study of Commercial RTOS **(6)**

Architecture of RT Linux, Initialization Task Management in RT Linux, Scheduling, Memory Management, Task Synchronization.

Text Books:

1. Real- Time Systems Design and Analysis.. Tools for the Practitioner by Phillip A Laplante, Seppo J.Ovaska ,Wiley - 4th Edition (For Units 1, 2, 3, 4,5)
2. Embedded Real Time Systems: Concepts, Design and Programming - Dr. K.V.K. Prasad - Black Book, Edition: 2014 (Unit 6)

References :

1 . Real Time Systems Theory and Practice , Rajib Mall , Pearson Education .

Term work :

It should consist of minimum 8 – 10 assignments based on the above topics, out of which few practical assignments should be on RTLinux / QNX / VxWorks / MQX / other RTOS.

CS8E04. ELECTIVE II – A) Internet of Things

Lecture : 3 hrs / week **Theory** : 100 Marks
Tutorial : 1 hr/ week **Termwork** : 25 Marks

Course Objectives:

1. To learn Internet of Things Technology
2. To know the basics of RFID, sensor and GPS technologies
3. To aware students about wireless technologies and IoT applications

Section - I

UNIT 1. Introduction **(6)**

What is the Internet of Things? : History of IoT, About objects/things in the IoT, Overview and motivations, Examples of applications, IoT definitions, IoT Frame work, General observations, ITU-T views, working definitions, Basic nodal capabilities.

UNIT 2. Fundamental IoT Mechanisms & Key Technologies : (6)

Identification of IoT objects and services, Structural aspects of the IoT, Environment characteristics, Traffic characteristics ,scalability, Interoperability, Security and Privacy, Open architecture, Key IoT Technologies ,Device Intelligence, Communication capabilities, Mobility support, Device Power, Sensor Technology, RFID technology, Satellite Technology.

UNIT 3. Radio Frequency Identification Technology: (6)

Introduction, Principles of RFID, Components of an RFID system, Reader, RFID tags, RFID middleware, Issue.

Wireless Sensor Networks: History and context, node, connecting nodes, networking nodes, securing communication.

Section - II

UNIT 4. Wireless Technologies For IoT : Layer ½ Connectivity : (6)

WPAN Technologies for IoT/M2M, Zigbee /IEEE 802.15.4, Radio Frequency for consumer Electronics (RF4CE), Bluetooth and its low-energy profile , IEEE 802.15.6 WBANS, IEEE 802.15 WPAN TG4j,MBANS,NFC,dedicated short range communication(DSRC) & related protocols. Comparison of WPAN technologies cellular & mobile network technologies for IoT/M2M.

UNIT 5. Governance of The Internet Of Things: (6)

Introduction, Notion of governance, aspects of governance, Aspects of governance Bodies subject to governing principles, private organizations, International regulation and supervisor, substantive principles for IoT governance, Legitimacy and inclusion of stakeholders, transparency, accountability. IoT infrastructure governance, robustness, availability, reliability, interoperability, access. Future governance issues, practical implications, legal implications.

UNIT 6. Internet Of Things Application Examples: (6)

Smart Metering, advanced metering infrastructure, e-Health/Body area network, City automation, automotive applications. Home automation, smart cards, Tracking, Over-The-Air passive surveillance/Ring of steel, Control application examples.

Text Books :

1. Hakima Chaouchi, The Internet of Things, Connecting Objects to the Web, Wiley Publications (for Units 1, 3, 5, 6)
2. Daniel Minoli,"Building the Internet of Things with IPv6 and MIPv6 The Evolving World of M2M Communications", Wiley Publications (for Units 2,4)

Reference Books :

1. Bernd Scholz-Reiter, Florian Michahelles, "Architecting the Internet of Things", ISBN 978-3842-19156-5, Springer.

2. Olivier Hersent, David Boswarthick, Omar Elloumi, "The Internet of Things" Key Applications and Protocols, ISBN 978-1-119-99435-0, Wiley Publications.

CS8E04. ELECTIVE II – B) Software Testing Quality and Assurance

Lecture : 3 hrs / week **Theory** : 100 Marks
Tutorial : 1 hr/ week **Termwork** : 25 Marks

Course Objectives:

1) To provide knowledge about fundamentals of software testing and software quality
2) To understand the fundamentals of software verification
3) To understand and evaluate metrics and models used in software testing
4) To understand and compare testing web applications and desktop applications
5) To understand, compare and Choose from various software project assessment methods

Section - I

Unit 1. Introduction (4)

Some Software Failures, Testing Process, Some Terminologies, Limitations of Testing, The V Shaped software life cycle model

Unit 2. Software Verification (8)

Verification Methods, SRS document verification, SDD document verification, Source code reviews, User documentation verification, Software project audit

Creating test cases from SRS and Use cases: Use Case Diagram and Use Cases, Generation of test cases from use cases, Guidelines for generating validity checks, strategies for data validity, Database testing

Unit 3. Regression Testing (7)

What is regression testing?, Regression Test cases selection, Reducing the number of test cases, Risk analysis, Code coverage prioritization techniques

Object oriented testing: What is Object orientation?, What is object oriented testing?, Path testing, State based testing, Class testing

Section - II

Unit 4. Measurement - what is it and why do it? (6)

Measurement in everyday life, Measurement in software engineering, scope of software metrics

Metrics and Models in Software testing: Software Metrics, Categories of Metrics, Object oriented Metrics used in testing, what should we measure during testing, Software Quality attributes prediction models

Unit 5. Measuring Internal Product Attribute Size (5)

Aspects of software size, Length, Reuse, Functionality

Measuring External product Attributes: Modeling software quality, measuring aspects of software quality

Unit 6. Testing Web applications **(6)**

What is web testing?, functional testing, UI testing, Usability testing, configurations and compatibility testing, security testing, performance testing, database testing, post deployment testing, web metrics.

Automated Test data generation: Automated Test Data generation, Approaches to test data generation, Test data generation tools

Text Books:

1) Software testing: Yogesh Singh, Cambridge University Press, First Edition

2) Software Metrics – A Rigorous & Practical approach: Norman Fenton, Shari Lawrence Pfleeger, 2nd Edition (Thomson Press) (for unit 4 Measurement-what is it and why do it? and unit 5)

3) Software Quality Engineering , Jeff Tian , Wiley India Ltd.

Reference Books:

1) Foundations of Software testing: Aditya P. Mathur, Pearson, Second Edition

2) Software Testing: Ron Patton, Pearson (SAMS), Second Edition

3) Software Quality, Mordechai Ben Menachem, Garry S. Marliss, BS Publications

Guidelines for tutorials:

It should consist of 8-10 assignments based on the following topics:

1. Software Testing Process, its need and limitations
2. Verification at different phases of SDLC for particular case study (SRS document verification, SDD document verification, Source code reviews, User documentation verification, Software project audit etc.)
3. Creating test cases from SRS and Use cases for particular case study
4. Generation of validity checks for particular case study
5. Regression testing with Test cases selection / Regression testing with reducing the number of test cases / Regression testing with code coverage prioritization techniques
6. Generation of test cases using Path testing/ State based testing/Class testing for particular case Study
7. Measurement in Software Engineering
8. Software Metrics: Object oriented Metrics used in testing
9. Calculation of Software Quality attributes using different prediction models
10. Measurement of Internal / External Product Attributes
11. Generation of test cases in different key areas of Web application testing
12. Automated test data generation

CS8E04. ELECTIVE II – C) Introduction to Mainframes

Lecture : 3 hrs / week
Tutorial : 1 hr/ week
Theory : 100 Marks
Termwork : 25 Marks

Objectives:

1. Students will understand the fundamentals of Mainframes
2. Students will be able to know basics of JCL, COBOL & DB2
3. Students will simulate COBOL and JCL programs using SPFLite and Hercules and experience the Mainframes developer role

Section – I

Unit 1. Introduction to IBM Mainframe (4)

Hardware configurations, Processors, Multiprocessing, Input/Output Devices, Applications, Characteristic Features of Mainframe Operating System, Mainframe Configurations, Roles in the Mainframe World, Typical Mainframe Workloads.

Unit 2. Z/OS, MVS and VSAM : (6)

z/Os and other Mainframe operating systems, What is z/OS,Overview of z/OS facilities, virtual Storage and other Mainframe Concepts, Workload management, MVS Concepts , Address Spaces ,Addressing Mode and Residence Mode , Multiple Virtual Storage, Multiprogramming, MVS/370 Address Space Organizations, How data sets are stored?, Catalogs, Data Set Organization, VSAM Basics.

Unit 3. Introduction to JCL: (8)

Introduction to Job Control language-Mainframe information representation and storage, sequential and partitioned datasets, Indexed files, structure of JCL, JOB statement, EXEC statement, JOB and EXEC statements, DD statement, JCL procedures and symbolic parameters, IBM utility programs.

Section – II

Unit 4. COBOL Programming I : (8)

Introduction, History, coding format for COBOL programs, structure of COBOL program, character set, COBOL words, data names and identifiers, literals, figurative constants, continuation of lines, language description notation, IDENTIFICATION DIVISION, ENVIRONMENT DIVISION, DATA DIVISION-Level structure, data description entries, USAGE Clause, REDEFINES Clause, RENAMES Clause, SIGN Clause, FILE SECTION, WORKING-STORAGE SECTION, Editing, PROCEDURE DIVISION and basic verbs - Structure, MOVE, Arithmetic and Sequence Control Verbs, Input and Output Verbs, Conditional Verb

Unit 5. COBOL Programming II: (4)

Table Handling - OCCURS Clause and Subscripting, Assigning values to table elements, Multidimensional Tables, PERFORM verb and Table Handling, Indexed Tables and Indexing, SET verb, SEARCH verb. Statements for Sequential Files- OPEN, CLOSE, WRITE, REWRITE. Miscellaneous verbs- SORT, MERGE, STRING, UNSTRING.

Unit 6. Overview of DB2 : **(6)**

Introduction to DB2 , Major components of DB2- System Service component, Locking Service component, Database Service component, DB2 Application program preparation and Execution,DB2 Objects-Databases, Tablespaces, Stored tables, Indexes, Indexspaces, Storage groups, View, Bufferpool. DB2 SQL programming – Types of SQL statements, DCL, DDL, DML, Advanced SQL topics, UPDATE operations, Aggregate functions

Text Books :

1. IBM Mainframe Handbook – Alexis Leon. (For Unit 1, 2, 3, 6)

2. M.K. Roy and D. Ghosh Dastidar, "Cobol Programming", Tata McGraw Hill, Second Edition. (For Unit 4, 5)

Reference Books :

1.Introduction to the New Mainframe z/OS Basics- Mike Ebbers, John Kettner, Wayne O'Brien, Bill Ogden - Redbooks http://www.redbooks.ibm.com/redbooks/pdfs/sg246366.pdf (Unit 1, 2)

CS8L05. WEB TECHNOLOGIES-II

Lecture	: 2 hrs / week	**Termwork**	: 50 Marks
Practical	: 4 hr/ week	**POE**	: 50 Marks

Course Objectives:

1. To introduce emerging Web technologies concepts and tools.
2. To introduce client side and server side scripting languages and validation techniques.
3. To learn database access technologies and state management techniques.
4. To develop real life Web applications using ASP.NET and PHP

Section - I

Unit 1:Introduction to ASP.NET 4.5 **(6)**

ONE ASP.NET: Introducing One ASP.NET, Simplifying a Complex Ecosystem, How Do You Benefit?

ASP.NET WEB FORMS STRUCTURE: Application Location Options, The ASP.NET Page Structure Options, ASP.NET 4.5 Page Directives, ASP.NET Page Events, Dealing with Postbacks, Cross-Page Posting ,ASP.NET Application Folders, Compilation, Build Providers, Global.asax,

Unit 2: Servlet Controls **(6)**

ASP.NET SERVER CONTROLS AND CLIENT-SIDE SCRIPTS: ASP.NET Server Controls, HTML Server Controls, Identifying ASP.NET Server Controls, Manipulating Pages and Server Controls with JavaScript.

ASP.NET WEB SERVER CONTROLS: An Overview of Web Server Controls, The Label Server Control, The Literal Server Control, The TextBox Server Control, The Button Server Control, The LinkButton Server Control, The ImageButton Server Control, The HyperLink Server Control, The DropDownList Server Control, The Visually Removing Items from a Collection, The ListBox Server Control, The CheckBox Server Control, The CheckBoxList Server Control, The RadioButton Server Control, The RadioButtonList Server Control, The Image Server Control, The Table Server Control, The Calendar Server Control, The AdRotator Server Control, The Xml Server Control, The Panel Server Control, The PlaceHolder Server Control, The BulletedList Server Control, The HiddenField Server Control, The FileUpload Server Control, The MultiView Server Control and The View Server Controls, The Wizard Server Control, The ImageMap Server Control.

VALIDATION SERVER CONTROLS: - Understanding Validation, Client-Side versus Server-Side Validation, ASP.NET Validation Server Controls, Turning Off Client Side Validation ,Using Images and Sounds for Error Notifications ,Working with Validation Groups

Unit 3: Data Binding and State Management (6)

DATA BINDING: Data Source Controls, Data Source Control Caching, Data-Bound Controls, Other Data-Bound Controls, Inline Data-Binding Syntax, Using Expressions and Expression Builders

STATE MANAGEMENT: Your Session State Choices, Understanding the Session Object in ASP.NET, The Application Object, QueryStrings, Cookies, Postbacks and Cross-Page Postbacks, Hidden Fields, ViewState, and ControlState, UsingHttpContext.Current.Items for Very Short-Term Storage

Section - II

Unit 4 : Client Side Development (6)

AJAX: Understanding the need of AJAX, ASP.NET AJAX and Visual Studio 2012, Binding ASP.NET AJAX Applications, ASP.NET AJAX's Server Side Controls, Using Multiple Update Panel Control, Working with page history, Script Combining.

JQuery: Introduction to JQuery, Selecting Elements, Modifying Elements, Event Handing, Ajax, JQuery UI

Unit 5: //Basics of PHP (6)

Introducing PHP: History, General Language Feature

PHP Basics: Embedding PHP code in Your Web Pages, Commenting Your Code, Outputting Data to the Browser, PHP supported Data Types, Identifiers, Variables, Constants, Expressions, String Interpolation, and Control Structures

Functions: Invoking a Function, Creating a Function, Function Libraries

Array: What is Array?, Creating an array, outputting an Array, Merging, slicing, splicing and Dissecting Arrays, Other useful Array Functions

Unit 6: Advanced Topics in PHP **(6)**

Object-Oriented PHP: The benefits of OOP, Key OOP Concepts, Constructor and Destructors, Static Class Members, The instanceof Keyword, Helper Functions.

Advanced OOP Features: Object Cloning, Inheritance, Interfaces, Abstract classes, Introducing namespaces.

Strings and Regular Expressions: Regular Expressions, Other String-Specific Functions, Alternatives for Regular Expression Functions

Working with HTML Forms: PHP and Web Forms, Validating Form Data

Handling File Uploads: Uploading Files with PHP

Using PHP with MySQL: Installation Prerequisites, Using the MySqli Extension, Interacting with the Database, Executing Database Transactions

Session Handlers: What Is Session Handling, Configuration Directives, Working with Sessions, Practical Session-Handling Examples, Creating Custom Session Handlers

Text Books:

1. Professional ASP.NET 4.5 in C# and VB-Published by John Wiley & Sons, Inc. (WROX)
2. Beginning PHP and MySQL: From Novice to Professional, Fourth Edition - W. Jason Gilmore

Reference Books:

1. ASP.NET 4.5- Black book – Kogent Dreamtech Publication

Open Source Resources

http://www.php.net

Sample Experiment List:

It should consist of 17-20 experiments based on the following topics.

1. Create registration form using different server controls
2. Accepting and validating user entered data in registration form using ASP.NET
3. Write a program to manage session in ASP.Net
4. Reading and writing HTML contents with JQuery
5. Write a sample application to demonstrate AJAX
6. Display database contents from SQL server or Oracle database using SQL Command class from ASP.NET
7. Display parameterized data using SQLDataReader and GridView in ASP.NET
8. Database access using DataSet in ASP.NET
9. Installing Apache and PHP on Linux, Configuring PHP at Build Time on Linux. Or Installation of XAMPP
10. Hello world Program-Embedded HTML with PHP

11. Program based on PHP variables, Expression, arrays, control structure
12. Experiment Based on OOP and Advance OOP PHP
13. Form validation using PHP using regular expressions
14. Upload various types of file from client side to server with validation
15. Write a program to send Mail using PHP
16. Insert user entered data in form to MySQL database using PHP
17. Update user's data stored in MySQL database using PHP
18. Write a program to manage session in PHP having login facility in any web application

CS8L06. PROJECT - II

Practical : 4 hrs / week

Termwork : 75 Marks
OE : 75 Marks

Objective:

The group will continue to work on the project selected during the semester VII and submit the completed project work to the department at the end of semester VIII as mentioned below-

1. The workable project.
2. The project report in the bound journal complete in all respect with the following: -
    i) Problem specifications.
    ii) System definition – requirement analysis.
    iii) System design – dataflow diagrams, database design
    iv) System implementation – algorithm, code documentation
    v) Test results and test report.
    vi) In case of object oriented approach – appropriate process be followed.
    vii) Open Source tools like Latex can be used for report preparation.

Termwork:

Term work will be jointly assessed by a panel of teachers appointed by Head of the Department

External Exam:

Oral examination will be conducted by internal and external examiners as appointed by the Shivaji 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**

CS8L07. COMMUNITY SERVICES

Practical : 2 hrs / week **Termwork** : 25 Marks

Objectives:

1. To create an awareness among the common man of Western Maharashtra region and area coming under jurisdiction of the Shivaji University regarding the e-services provided by various public sector organization
2. To promote the use of technological services in day-to-day activities.
3. To understand the problems of the locality.
4. To make the student aware of the various engineering tools and techniques used in eservices.
5. Creating awareness of RTI (Right To Information) among general public for procuring public documents and it's appropriate use.

Details:

The students project group is expected to do the following:

1. With the prior written permission from the Head of the Institute the project group should visit any Public Sector / Government/ Semi government organization like – Zilha Parishad, Collector Office, Municipal Corporation, Tahasildar Office, RTO, MSEB, Court, Railway station , Tourism Services, agricultural service sector, Banks where the facilities of e-governance and e-services available for public purposes.
2. The project group should understand the public related services and identify the required services for the common man.
3. Two/Three groups should plan awareness programs/camps to be carried out in the nearby villages / Taluka places / residential colonies / localities and visit the suitable areas along with the staff to create awareness among the common man about various eservices available in public domain.
4. They should prepare a presentation simulating the services that are being exposed to common man and give a demonstration during their visit to the concerned area.
5. Further group should take the feedback from the concerned locality on a pre-designed format that may be provided by the Head of the Institute.
6. Group should prepare a report detailing:
   a. The kind of services chosen.
   b. The office / organization visited mentioning the authorities meet.
   c. The facilities provided by the chosen service.

d. Preparations for the visit.
e. Presentation Techniques & Tools used
f. Analysis of the Feedback Form filled during visit
g. Observations and conclusions during the entire work

7. Submission of the above report duly signed by the concerned staff and Head of the department is to be done to the department at the end of semester.

Equivalences of B. E. (CSE) for repeater / backlog students
BE (CSE) Sem.-VII

Sr. No.	B.E.(CSE) – I Pre-Revised	Equivalent / Replacement Subject (Revised)
1.	Advanced Computer Architecture	Advanced Computer Architecture Sem VII
2.	Distributed Systems	Distributed Systems Sem VII
3.	Advanced Database Systems	Advanced Database Systems Sem VII
4.	Elective –I A) Soft Computing B) Project Management C) Cyber Laws	Elective –I A) Soft Computing Sem VII B) Project Management Sem VIII C) Cyber Laws (**Pre-revised Sem VII**)
5.	Network Engineering	Network Engineering (**Pre-revised Sem VII**)

BE (CSE) Sem.-VIII

Sr. No.	B.E.(CSE) – II pre-Revised	Equivalent / Replacement Subject (Revised)
1.	Grid Technology	Grid Technology (**Pre-revised Sem VIII. Two more chances**)
2.	Storage Networks	Storage Networks (Sem VI)
3.	Real-time Operating System	Real-time Operating System (Sem VII)
4.	Elective –II A) Data Mining B) Business Intelligence System C) Adhoc Networks	Elective –II A) Data Mining (**Pre-revised Sem VIII)** B) Business Intelligence System (**Pre-revised Sem VIII**) C) Adhoc Wireless Networks (**Sem VII**)
5.	Web Technology	Web Technology (**Pre-revised Sem VIII**)