Course Code	Course Title	L	T	P	S	J	C
CSEN3071	Web Application Development and Software Frameworks	3	0	2	0	0	4
Course Owner	Department of CSE	Syllabus version			1.0		
Course Pre-requisite(s)		Contact hours			75		
Course Co-requisite(s)		Approved on: April 1, 2022					
Alternate Exposure							

This course enables the students to learn developing web applications right from web application design, web content development, client-side scripting, server-side scripting and creation of responsive web pages. The course imparts knowledge of relevant architectures and technologies required for web application development.

Course Objectives
1. Design static web page using Markup languages.
2. Design and implement web pages using style sheets.
3. Implement with java script web applications with dynamic web pages.
4. Understand working of Web servers
5. Develop web applications using frameworks.

Module I   Introduction to Web Application Designing   LTP   906

Introduction: Building a Web Application, Components – Client Side, Server side Components, 2 tier, n-tier architectures, Networks, Protocols. MVC Pattern.

HTML5: Basic syntax, HTML document structure, text formatting, images, lists, links, tables, forms, frames.

Cascading Style Sheets (CSS3): Levels of style sheets, style specification formats, selector forms, font properties, list properties, colour properties, alignment of text, background images, The Box Model.

Learning Outcomes:

After completion of this unit, the student will be able to

• Outline various components of a web application	L2
• Demonstrate the importance of HTML tags for designing web pages	L2
• Distinguish the design from content using various levels of Style Sheets	L4

Pedagogy tools: Blended learning, PPT, video lectures, self-reading, Practicals

Module II   Client-Side Scripting   LTP   906

JavaScript: Introduction, Functions, Arrays, DOM, Built-in Objects, Regular Expression, Event handling, Validation, Dynamic documents.

Learning Outcomes:

After completion of this unit, the student will be able to

• Design dynamic, interactive web pages by embedding Java script code in HTML	L6
• Demonstrate validations of user input and perform dynamic documents	L2

Pedagogy tools: Blended learning, video lectures, self-reading, PPT

Module III   XML, JSON   LTP   906

Syntax of XML, document structure, and document type definition, namespaces, XML schemas, document object model, presenting XML using CSS, XSLT, XPath, XQuery, FLOWR.
JSON: Features, JSON vs. XML, JSON Data Types, JSON Objects, JSON Arrays, JSON HTML.

Learning Outcomes:

After completion of this unit, the student will be able to

- Create XML documents and use Xquery to retrieve data   L5
- Develop application using JSON environment   L3

Pedagogy tools: Blended learning, video lectures, self-reading, PPT, Practicals

Module IV: Server side processing with Java   LTP   906

Introduction to Servlet, Life cycle of Servlet, Servlet methods, Java Server Pages.

Working with tomcat webserver Database connectivity – Servlets, JSP, JDBC, Practice of SQL Queries

Learning Outcomes:

After completion of this unit, the student will be able to
- Develop application using JSP   L5
- Demonstrate running of application on Tomcat server instance   L2
- Develop database driven web application   L5

Pedagogy tools: Blended learning, video lectures, self-reading, PPT, Practicals

Module V   Web Application Frameworks   LTP   906

Introduction to Web application development frameworks, Types of Frameworks. ReactJS. Angular JS.

Angular JS: Introduction, Angular JS Expressions, Modules, Data Binding, Controllers, DOM, Events, Forms, Validations.

ReactJS: Introduction, components, Styling, Form programing, Building and Deployment

Learning Outcomes:

After completion of this unit, the student will be able to
- Illustrate various application development frameworks   L2
- Develop application using AngularJS Framework   L5
- Develop application using ReactJS Framework   L5

Pedagogy tools: Blended learning, Case let, video lectures, self-reading

Textbook(s):
1. Programming the World Wide Web, 7th Edition, Robert W Sebesta, Pearson, 2013.
2. Pro Mean Stack Development, 1st Edition, ELad Elrom, Apress O'Reilly, 2016
3. Java Script & jQuery the missing manual, 2nd Edition, David sawyer mcfarland, O'Reilly, 2011.
4. Web Hosting for Dummies, 1st Edition, Peter Pollock, John Wiley & Sons, 2013.
5. RESTful web services, 1st Edition, Leonard Richardson, Ruby, O'Reilly, 2007.
6. FULL STACK REACT – The complete guide to ReactJS and Friends ,1st Edition, Anthony Accomazzo,Leanpub,2020.

Additional Reading

Reference Book(s):
1. Dietel and Nieto, Internet and World Wide Web - How to program, PHI/Pearson Education, 2006.
2. Web Technologies, HTML, JavaScript, PHP, Java, JSP, XML and AJAX, Black book, 1st Edition, Dream Tech, 2009
3. Web Technologies, 1st Edition 7th impression, Uttam K Roy, Oxford, 2012

Journal(s):
1.

Website(s):

LAB Experiments:
1. Design static web pages required for any online services web site.
2. Apply Cascading Style Sheets to the Web pages.

3. Design dynamic webpages using Java script.

4. Write JavaScript to validate input fields

5. Write an XML file to display various contents.

6. Write a XSD to validate an XML file.

7. Design a web application and deploy on Tomcat webserver

8. Connect to a Database (MySQL/SQLServer/Oracle/MongoDB) and create data and query data using JDBC

9. Implement a Simple Application using JSON

10. Develop a Complete Web Application for a simple case study using ReactJS /AngularJS

Lab Infrastructure:

SQL Server, Tomcat Server, Notepad++ editor, Eclipse, Opensource – ReactJS, AngularJS

Course Outcomes: After successful completion of the course the student will be able to:
1. Understand the fundamentals of web application development and frameworks. (L1)
2. Design interactive web pages with client and server side scripting (L5)
3. Apply validations on user input using Javascript (L3)
4. Compare and analyse XML and JSON documents. (L2)
5. Create and deploy Web Applications over web server. (L5)

	1-Low, 2- Medium and 3- High Correlation														
	Programme Outcomes (POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3					1							2		
CO2			3	2					2					2	
CO3		2	2												1
CO4		3											2		
CO5			3		2							2		2	