PRESIDENCY UNIVERSITY

(Established under the Presidency University Act, 2013 of the Karnataka Act 41 of 2013)

[2024-24 EVEN SEMESTER]

COURSE PLAN

SCHOOL: PSCS **DEPT: CSE** **DATE OF ISSUE:1/10/2025**

NAME OF THE PROGRAM	**:** B.Tech
P.R.C. APPROVAL REF.	**: PU/AC-24.7/SOCSE04/CSE/2022-2026**
SEMESTER/YEAR	**: VI Sem /III Year**
COURSE TITLE & CODE	**:** Front-end Full Stack Development (FEFSD) & CSE3150
COURSE CREDIT STRUCTURE	**:2-0-2-3**
CONTACT HOURS	**: 60 hours (30[L] +30[P])**
COURSE IC	**:** Dr.JayanthiKamalesakaran, Dr. Sridevi S, Mr. T Ramesh, Ms. M Pushpalatha
COURSE INSTRUCTOR(S)	**:** Dr.JayanthiKamalesakaran, Dr. Sridevi S, Mr. T Ramesh, Ms. M Pushpalatha, Ms Sunitha BJ, Mr Praveen Pawaskar, Ms Kalpana k, Ms Dhanya Dornadhula, Dr P Sudha, Mr Santhosh Kumar K L, Mr Syed Moshin Abbasi, Dr Joe arun raja, Mr. Jai Kumar
COURSE URL	**:** https://presidencyuniversity.linways.com/

PROGRAM OUTCOMES:

PO1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems. (M)

PO2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. (H)

PO3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. (H)

PO4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations (M)
PO6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings. (M)

PO10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions. (L)

PO11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. (M)

PROGRAM SPECIFIC OUTCOMES :

PSO 01. Disciplinary knowledge: Capable of demonstrating proficiency in analyzing and solving problems related to web development projects.

PSO 02. Problem Solving: Identify, formulate and apply appropriate techniques in the areas related to Bootstrap, HTML5, CSS3, JavaScript, Ajax, and jQuery.

PSO 03. Design/development of websites: Design and Develop various activities of web sites utilizing Node.js, NPM, and other relevant tools in the Angular.js and React.js ecosystems.

COURSE PREREQUISITES:

WEB TECHNOLOGIES-CSE2067

COURSE DESCRIPTION:

This intermediate course enables students to perform front-end full stack development, with emphasis on employability skills. The course covers key technologies and architectures that enable the student to design and implement front-end. On successful completion of this course, the student shall be able to pursue a career in full-stack development. The students shall develop strong problem-solving skills as part of this course.

COURSE OBJECTIVES

The objective of the course is to familiarize the learners with the concepts **of Front-end Full Stack Development** and attain **Employability** through **Experiential Learning techniques**.

COURSE OUTCOMES: On successful completion of the course the students shall be able to:

TABLE 1: COURSE OUTCOMES		
CO Number	**CO**	**Expected BLOOMS LEVEL**
CO 1	Design and develop static web pages using HTML5 elements and CSS3	Apply
CO 2	Develop responsive web pages using CSS, JavaScript and bootstrap	Apply
CO 3	Demonstrate the concepts of Angular.js to develop a web front-end.	Apply
CO 4	Illustrate the concepts of React.js to develop a web front-end	Apply

MAPPING OF C.O. WITH P.O.

[H- HIGH, M- MODERATE, L-LOW]

TABLE 2a: CO PO Mapping ARTICULATION MATRIX													
CO. No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13
CO1	M	H	H	-	M	-	-	-	M	L	-	M	-
CO2	M	H	H	-	M	-	-	-	M	L	-	M	-
CO3	M	H	H	-	M	-	-	-	M	L	-	M	-
CO4	M	H	H	-	M	-	-	-	M	L	-	M	-

TABLE 2b: CO PSO Mapping ARTICULATION MATRIX			
CO. No	PSO1	PSO2	PSO3
CO1	M	M	M
CO2	M	M	M
CO3	H	M	M
CO4	M	M	M

COURSE CONTENT (SYLLABUS):

Module: 1: Introduction to Web Technology [8L+6P Hours] [Apply]

HTML5 – Syntax, Attributes, Events, Web Forms 2.0, Web Storage, Canvas, Web Sockets;

CSS3 – Colors, Gradients, Text, Transform.

Module: 2: BootStrap and Advanced JavaScript [6L+6P Hours] [Apply]

Bootstrap for Responsive Web Design; JavaScript – Core syntax, HTML DOM, objects, classes, Async; Ajax , jQuery Introduction

Module:3: JavaScript Frameworks [8L+10P Hours] [Apply]

Setting up Development & Build Environment: Node.js and NPM; Introduction to TypeScript;

Working with OOP concepts with TypeScript; Angular Fundamentals; Angular CLI; Debugging Angular applications; Components & Databinding in Depth; Angular Directives; Using Services & Dependency Injection; Angular Routing; Observables; Handling Forms in Angular Apps; Output transformation using Pipes; Making Http Requests; Authentication & Route Protection; Dynamic Components; Angular Modules & Optimizing Angular Apps; Angular Animations; Adding Offline Capabilities with Service Workers; React.js ; Developing single page application.

Module:4: Fundamentals of DevOps and Project Management [8L+8P Hours] [Apply]

Introduction to Agile Methodology; Scrum Fundamentals; Scrum Roles, Artifacts and Rituals; DevOps – Architecture, Lifecycle, Workflow & Principles; DevOps Tools Overview – Jenkins, Docker, Kubernetes. Review of GIT source control. Deploying an Angular/React App; Unit Testing in Angular Apps (Jasmine, Karma).

SKILL SETS TO BE DEVELOPED:

Graduate of the B.Tech. Program in Computer Science and Engineering shall be able to;

1. **An attitude of enquiry.**
2. **Confidence and ability to tackle new problems.**
3. **Ability to interpret events and results.**
4. **Ability to work as a leader and as a member of a team.**
5. **Assess errors in systems/processes/programs/computations and eliminate them.**
6. Observe and measure physical phenomena.
7. Write reports.
8. **Select suitable equipment, instrument, materials & software**
9. **Locate faults in system/Processes/software.**
10. **Manipulative skills for setting and handling systems/Process/ Issues**
11. The ability to follow standard /legal procedures.
12. An awareness of the Professional Ethics.
13. Need to observe safety/General precautions.
14. To judge magnitudes/
15. Results/issues without actual measurement/actual contacts

DELIVERY PROCEDURE (PEDAGOGY):

TABLE 3: SPECIAL DELIVERY METHOD/ PEDAGOGY PLANNED WITH TOPICS				
S. No	**Lecture Number**	**Subtopic as per Lesson Plan**	**Pedagogy title/ Short explanation of adopted pedagogy**	**** At end of semester please update whether activity was done**
2	L10	JavaScript	Participative Learning	
3	L24	Angular	Experimental Learning	
4	L30	DevOps	Project-Based Learning	

REFERENCE MATERIALS:

Text Book

T1. Fender, Young, "Front-end Fundamentals",Leanpub, 2015

T2. Northwood, Chris, "The Full Stack Developer: Your Essential Guide to the Everyday Skills Expected of a Modern Full Stack Web Developer",APress, 2018

T3. "HTML & CSS: The Complete Reference, Fifth Edition", Thomas A. Powell, 2010

Reference Books

R1. Flanagan D S, "Javascript : The Definitive Guide" 7th Edition. 7th ed. O'Reilly Media; 2020.

R2. Alex Libby, Gaurav Gupta, and AsojTalesra. "Responsive Web Design with HTML5 and CSS3Essentials",Packt Publishing, 2016

R3. Duckett J Ruppert G Moore J. "Javascript&Jquery : Interactive Front-End Web Development.";Wiley; 2014.

R4. Greg Sidelnikov, "React.js Book_ Learning React JavaScript Library", 1 edition, Scratch-River TigrisLLC 2016

E.Resources

W1.https://www.youtube.com/watch?v=JGNTYXkVCVY&list=PLd3UqWTnYXOkTSBCBNyyhxo_jxlY_uTWA&index=2

W2. NPTEL: https://nptel.ac.in/courses/106106156

W3. COURSERA: https://in.coursera.org/learn/introduction-to-front-end-development

W4.edX:https://www.edx.org/course/introduction-to-cloud-development-with-html5-css3-and-javascript

W5. PU LI3B: https://presiuniv.knimbus.com/user#/home

SPECIFIC GUIDELINES TO STUDENTS:

1. Students are required to maintain minimum 75% of attendance
2. Technology enabled learning through NPTEL and online course may help in clear understanding the topics.
3. Follow the instructions of course instructor in both class and lab.
4. Avoid being absent in labs as it will affect the understanding of the experiments.
5. On time submission of assignments.
6. CA3-Certification of Nodejs, Angular js, React js will be accepted only from the platforms- NPTEL/HACKKERRANK / CODECHEF / COURSERA. Last date of submission is on or before 25/04/25

COURSE SCHEDULE

TABLE 4: COURSE BROAD SCHEDULE

Sl. No.	ACTIVITY	PLANNED STARTING DATE	PLANNED CONCLUDING DATE	TOTAL NUMBER OF PERIODS
01	Overview of the course	20.01.25	20.01.25	1
02	Module : 01	21.01.25	08.02.25	6
03	CA1 (Surprise Test-1)	09.02.25	09.02.25	1
04	Module: 02	10.02.25	28.02.25	5
05	CA2 (Quiz/Assignment)	03.03.25	03.03.25	1
06	Midterm	17.03.25	21.03.25	2
07	Module:03	04.03.25	11.04.25	8
08	Module:04	15.04.25	02.05.25	2
09	CA5 Seminar	05.05.25	10.05.25	4
10	End Term Examination	As Per CoE		

Sl. No.	Activity	Starting Date	Concluding Date	TotalNumber ofPeriods
01	Labsheet-1	20-Jan-2025	24-Jan-25	2
	Labsheet-2	27-Jan-25	31-Jan-25	2
02	Labsheet-3	03-Feb-25	07-Feb-25	2
	Labsheet-4	10-Feb-25	14-Feb-25	2
03	Lab sheet-5	17-Feb-25	21-Feb-25	2
04	Lab sheet-6	24-Feb-25	28-Feb-25	2
05	Lab sheet-7	03-Mar-25	07-Mar-25	2
06	Lab sheet-8	10-Mar-25	14-Mar-25	2
07	Mid Term	17-Mar-25	21-Mar-25	2
08	Lab sheet-9	24-Mar-25	28-Mar-25	2
09	Lab sheet-10	31-Mar-25	04-Apr-25	2

10	Lab sheet11& Labsheet-12	07-Apr-25	11-Apr-25	2
11	CA3	21-Apr-25	25-Apr-25	2
12	CA4	28-Apr-25	02-May-25	2
13	CA6	05-May-25	09-May-25	2

DETAILED SCHEDULE OF INSTRUCTION:

TABLE 5: DETAILED COURSE SCHEDULE / LESSON PLAN (THEORY)

Session Number	**Lesson Title**	**Topics & Learning Objectives** **LO: Student shall be able to**	**LOL (Lower Order Learning)**	**HOL (Higher Order Learning)**	**Course Outcome**	**Mode of Delivery / Pedagogy Adopted**	**Reference (Chapter & Page No.)**
L1	Overview of the Course	Understand the importance of the course and Carrier opportunities	LOL1	-	CO1,2,3,4	CHALK AND TALK	T3-Introduction (Page-6)
L2	Module 1: HTML5	Syntax, Attributes LO1: What is the purpose of the <!DOCTYPE html> declaration in an HTML5 document? LO2: Evaluate the use of the data-* attributes in a web application. How do these attributes improve flexibility compared to hardcoding values within JavaScript?	LOL1 , LOL2	-	CO1	CHALK AND TALK	T3-Ch2 (Page 55) R2, Chapter1 (Page-6)
L3	Module 1: HTML5	Events LO1:What is an event in HTML5, and can you name three common types of events? LO2: Design an interactive HTML5 webpage that uses at least three different	LO L1,L OL2	-	CO1	CHALK AND TALK	T3 –chapter3 Page-146

		event types (e.g., onclick, onmouseover, onchange) to enhance user interaction. Explain your choices of events and their implementation.					
L4	Module 1: HTML5	Web Forms 2.0 **LO1**: What is Web Forms 2.0, and name two new input types introduced in HTML5 for forms. **LO2**: Analyze the advantages of using Web Forms 2.0 input validation attributes (e.g., required, pattern, min, max) over JavaScript-based validation.	LOL1 , LOL2		CO1	CHAL K AND TALK	T3 –Chapter2- page 83
L5	Module 1: HTML5	Web Storage, Canvas, Web Sockets LO1: Provide a brief definition and purpose of Canvas, and Web Sockets? LO2: Considering the dynamic nature of modern web development, discuss how the integration of HTML5 features such as Web Forms 2.0, Web Storage, Canvas, and Web Sockets can contribute to enhancing user experiences.	LO L1,L OL2		CO1	CHAL K AND TALK	R2, Chapter1 Page-6 T3-chapter 2 Page 83
L6	CSS3	Colors, Gradients LO1: Provide a brief explanation of the role and application of CSS3 in web development, focusing on the properties related to Colors, Gradients, Text, and Transform.	LOL1 , LOL2		CO1	Participativ e Learning	T1, Chapter 4, Page 38

		LO2: Explore how the advanced features of CSS3, including Colors, Gradients, Text, and Transform, contribute to the visual design and user interface of modern websites.					
L7	Module 1: CSS3	Text **LO1**: What is the purpose of the text-shadow property in CSS3, and how is it applied? LO2:Design a visually appealing heading for a webpage using CSS3 text properties, such as text-shadow, text-transform, and letter-spacing. Explain how these properties enhance the overall design. Transform **LO1**: What is the purpose of the transform property in CSS3, and name two types of transformations it supports. **LO2**: Create a CSS animation effect where an element rotates and scales simultaneously using the transform property. Explain the steps involved and the significance of combining transformations.	LOL1 , LOL2		CO1	CHAL K AND TALK	T3-chapter5 Page 600
L8	Continuous Assessment of Module-1						
L9	Module 2 Responsive web design	BootStrap for Responsive Web Design Async;	LOL1 , LOL2	-	CO2	CHAL K AND TALK	R3, Chapter7 Page-293

		LO1: Can you provide a brief overview of how Bootstrap is utilized in responsive web design, and what are the key advantages it offers for creating mobile-friendly interfaces? LO2: Compare and contrast the approaches of Bootstrap, Async, Ajax, and jQuery in enhancing the user experience of web applications. Provide examples of scenarios where each technology is particularly beneficial and discuss considerations for selecting the most suitable approach in different development contexts.					
L10	JavaScript	Core syntax, HTML DOM,Object,classes LO1: Explain the significance of understanding the core syntax of JavaScript in web development. LO1: Discuss the need the HTML Document Object Model (DOM). Provide examples of practical applications where knowledge HTML DOM manipulation is crucial for creating dynamic and interactive web pages.	LOL1 , LOL2		CO2	Participativ e Learning	T2, Page-30
L11	Module 2 Ajax Introductio	**LO1**: What is jQuery, and how does it simplify JavaScript	LOL1 , LOL2	-	CO2	CHAL K AND	Chapter 7- page 300

	n jQuery Introductio n	coding? **LO2**: Develop a simple web page that uses jQuery to implement an interactive feature, such as toggling the visibility of a section or creating an image slider. Explain how jQuery is utilized to achieve the functionality.				TALK	
L12	Module:2 JQuery	Introduction, syntax, Events, Selectors, Effects, classes LO1: Can you provide a brief overview of the role and purpose of classes in the context of JavaScript programming? LO2: Explain how the concepts of Events, Selectors, Effects collectively contribute to creating dynamic and interactive web pages using JavaScript.	LOL1 , LOL2		CO2	CHAL K AND TALK	R3, Chapter 7 Page No.293
L13	Module 2: Ajax	Introduction, Request, Response LO1:What is the basic definition of an HTTP request, and how does it differ from an HTTP response? LO2: Discuss the intricacies of the HTTP protocol, detailing how requests and responses facilitate communication between clients and servers	LOL1 , LOL2		CO2	CHAL K AND TALK	R3, chapter8, page-367
L14	Continuous Assesment-2 of Module-2						

L15	Module 3: Setting up Development & Build Environment	Node.js and NPM, Introduction to TypeScript; Working with OOP concepts with TypeScript LO1: Provide a brief explanation of the roles of Node.js and NPM in modern web development. LO2: Discuss how the combination of Node.js and NPM revolutionizes server-side JavaScript development. Explain the advantages and use cases of using Node.js for server-side programming, and elaborate on how NPM (Node Package Manager) facilitates package management and dependency resolution in Node.js projects.	LOL2	-	CO2	CHALK AND TALK	T1, Chapter7, Page-50
L16	Module 3: Angular Fundamentals	Components & Databinding in Depth; Angular Directives LO1: Explain the basic concept of components and data binding in Angular. LO2: Delve into the intricacies of Angular components and data binding. Discuss how Angular components are structured, how they facilitate data binding, and explore advanced techniques for effective data communication between components. Using Services & Dependency Injection, Angular Routing, Observables	LOL1, LOL2	-	CO3	Experimental Learning	T1, Chapter3, Page no.16

		LO1: Can you explain the primary purpose of using services and dependency injection in Angular development? High-Order LO1: LO2: Explore into the advanced features of Angular, discussing how services and dependency injection contribute to the modularity, maintainability, and scalability of Angular applications.					
L17	Module 3: Angular Fundamentals	Using Services & Dependency Injection, Angular Routing, Observables LO1: Can you explain the primary purpose of using services and dependency injection in Angular development? High-Order LO1: LO2: Explore into the advanced features of Angular, discussing how services and dependency injection contribute to the modularity, maintainability, and scalability of Angular applications.	LOL2		CO3	CHALK AND TALK	T1, Chapter3, Page no.16
L18	Module 3: Angular Fundamentals	Handling Forms in Angular Apps, Output transformation using Pipes, Making Http Requests LO1: What is the role of form handling in Angular applications, and how does Angular simplify the process? LO2: Explore the complexities of	LOL1, LOL2	-	CO3	CHALK AND TALK	T1, Chapter3, Page no.16-40

		handling forms in Angular applications, including form validation, submission, and interaction with the backend..					
L19	Mid Term						
L20	Mid Term						
L21	Module 3: Angular Fundamentals	Authentication & Route Protection, Dynamic Components LO1: Why is authentication and route protection important in Angular applications? LO2: Investigate the intricacies of implementing authentication and route protection in Angular. Discuss best practices for securing routes and ensuring user authentication.	LOL1, LOL2	-	CO3	CHALK AND TALK	T1, Chapter3, Page no.16
L22	Module 3: Angular Fundamentals	Angular Modules & Optimizing Angular Apps, Deploying an Angular App, Angular Animations LO1: What is the role of Angular modules in structuring an Angular application, and why is optimizing Angular apps important? LO2: Explore the advanced aspects of Angular development, including the use of Angular modules for structuring applications and optimizing Angular	-	-	CO3	CHALK AND TALK	T1, Chapter3, Page no.16-40

		apps for better performance					
L23	Module 3: Angular Fundamentals	Adding Offline Capabilities with Service Workers, Unit Testing in Angular Apps LO1: What is the primary benefit of adding offline capabilities with service workers in an Angular application? LO1: Delve into the advanced features of Angular, specifically the integration of offline capabilities using service workers.	LOL2, LOL3	-	CO3	CHALK AND TALK	T1, Chapter3, Page no.16
L24	Module 3: Angular CLI	Introduction tO Angular CLI LO1: Provide a brief overview of what Angular CLI is and its basic functionality. LO2: Explore the features and capabilities of Angular CLI in-depth, discussing how it streamlines the development process in Angular applications. Highlight Debugging Angular applications LO1: What are some common debugging tools used in web development, and how do they assist developers in identifying and fixing issues? LO2: Explore advanced debugging techniques and tools			CO3	Experimental Learning	T1, Chapter3, Page no.16-40

		used in web development. Discuss how developers can effectively troubleshoot complex issues, identify performance bottlenecks, and debug asynchronous code Overview of React.js, Advantages of React.js, React.js vs. Other Frameworks LO1: Can you provide a brief overview of React.js and its primary use in web development? LO2: Compare and contrast React.js with other frameworks, highlighting its distinctive features and benefits					
L25	Module 4: Distinct Ways of Initializing a React Class and JSX Walkthrough	Using ES6 Classes, Using React.createClass, Introduction to JSX, Benefits of Using JSX, JSX Syntax and Examples Low-Order LO1: LO1: What are the distinct ways of initializing a React class, and how do they differ? LO2: Dive into the initialization process of React classes, exploring the various ways to instantiate them.	LOL2 , LOL3	-	CO4	CHALK AND TALK	R4, Page- 32-55
L26	Module 4: React Testing	Introduction to React Testing,Types of React Testing, Testing Libraries and Framework	LOL2 , LOL3	-	CO4	CHALK AND TALK	R4, Lesson3, Page- 69-100

		LO1: What is the purpose of testing in React development, and why is it important? LO2: Discuss the concept of React testing, exploring the different types of testing employed in React applications.					
L27	Module 4: Introduction to Agile	Introduction to Agile Continuous Assesment-5 of Module-4 LO1: What is Agile Methodology in software development, and what are its key principles? LO2: Discuss the core values of Agile and how it differs from traditional project management approaches.	LOL1 , LOL2	-	CO4	CHALK AND TALK	T2, Chapter2 page-11
L28	Module 4: Introduction to Agile Methodology,Scrum	Scrum Fundamentals; Scrum Roles, Artifacts and Rituals; Continuous Assesment-5 of Module-4 LO1: Can you provide a brief definition of Scrum and its key components? LO2: Given a hypothetical project scenario, describe how the roles, artifacts, and rituals of Scrum.	LOL1 , LOL2		CO4	CHALK AND TALK	T2, chapter 2 Page-23-50
L29	Module 4: DevOps and DevOps	Architecture, Lifecycle, Workflow & Principles. Tools: Jenkins,	LOL1 , LOL2	-	CO4	CHALK AND TALK	T2, Chapter 4, Page-67-90

	Tools Overview	Docker, Kubernetes. Continuous Assesment-5 of Module-4 LO1: What is the primary purpose of Docker in the context of software development, and how does it contribute to the overall workflow? LO2: In a real-world scenario, describe how the integration of Jenkins, Docker, and Kubernetes in a DevOps environment					
L30	Module 4: DevOps and DevOps Tools Overview	Architecture, Lifecycle, Workflow & Principles. Tools: Jenkins, Docker, Kubernetes. Continuous Assesment-5 of Module-4 LO1: What is the primary purpose of Docker in the context of software development, and how does it contribute to the overall workflow? LO2: In a real-world scenario, describe how the integration of Jenkins, Docker, and Kubernetes in a DevOps environment	LOL1 , LOL2	-	CO4	Project Based Learning	T2, Chapter 4, Page-67-90

TABLE 5: DETAILED SCHEDULE OF INSTRUCTION/LESSONPLAN (LAB)

Sl. No.	Task No	Topics & Learning Outcomes	LOL (Lower Order Learning)	HOL (Higher Order Learning)	Number of Lab Sessions required to complete the task	Skills to be developed	Course Outcome to be developed

		LO: Student shall be able to					
01	P1	**Familiarization of HTML and CSS** LO1: What is the general overview of the Frontend Full Stack course, and why is laboratory familiarization important? LO2: Explore the comprehensive concepts covered in the Frontend Full Stack course..	LOL1	-	2	1,2,3	CO1
02	P2	**Create an HTML webpage showcasing biodata with CSS styling.Use HTML5 tags and CSS to make it attractive.** LO1:What does HTML5 stand for, and how does it differ from previous versions of HTML? LO2: Explore how HTML5 addresses modern web development challenges and enables the creation of more interactive and dynamic web pages. Additionally, discuss the impact of HTML5 on multimedia, mobile development, and the overall user experience in web applications	LOL1, LOL3	-	2	1,3,5,8	CO1

03	P3	**Design a Web Page for Interactive web page for new restaurant using various CSS3 features such as colours, text styles, transforms, and gradients.** LO1: What does CSS3 stand for, and how does it extend the capabilities of CSS? LO2: Analyze how CSS3 contributes to the design and layout of modern web pages, including aspects such as colors, gradients, and transformations. Additionally, discuss the role of CSS3 in responsive web design and its impact on the overall visual appeal and user experience of websites.	LOL2	L3	2	1,2,3,5,6, 7,8,9	CO1
04	P4	**Create a simple web form to gather user information.** LO1: What is the purpose of Bootstrap in web development, and how does it facilitate responsive design? LO2: Provide examples of how Bootstrap simplifies the implementation of common design patterns and enhances the overall user experience. Discuss	LOL1, LOL2	-	2	1,2,3,5,6, 7,8,9	CO2

		considerations and best practices for effectively using Bootstrap in conjunction with HTML DOM to create modern and responsive web applications.					
05	P5	**Basic JavaScript Exercises & Canvas Drawing Application.** LO1: Can you provide a brief overview of Bootstrap and its role in web development? LO2: Provide examples of how Bootstrap simplifies the design and layout process, and discuss considerations for optimizing the integration of Bootstrap with the HTML DOM to ensure a seamless and effective development workflow.	LOL1, LOL3		2	1,2,3,5,6, 7,8,9	CO2
06	P6	**JavaScript Exercises for form validation.** LO1: What is jQuery, and how does it simplify DOM manipulation in web development? LO2: Explore real-world scenarios where jQuery can enhance the development process and provide a more efficient way to interact with the HTML Document Object Model. Additionally, discuss considerations for using jQuery in modern web	LOL2, LOL3	-	2	1,2,3,5,6, 7,8,9	CO2

		development, considering the rise of alternative technologies and frameworks.					
07	P7	**JavaScript Exercises for Online Student Registration.** LO1: What is JavaScript, and how is it used in web development? LO2: Examine how JavaScript is employed for manipulating the Document Object Model (DOM) to create dynamic and interactive user interfaces. Discuss the evolution of JavaScript, its compatibility with different browsers, and its role in client-side scripting.	LOL1	L3	2	1,2,3,5,6, 7,8,9	CO3
08	P8	**Create a RSVP Form using the bootstrap's form controls.** LO1: What is JavaScript, and how does it contribute to the interactivity of web pages? LO2: Explore the role of Ajax (Asynchronous JavaScript and XML) in enabling asynchronous communication with a web server, allowing for seamless data retrieval and updates without requiring a full page reload. Provide examples of how JavaScript and Ajax are commonly used	LOL2, LOL3	-	2	1,2,3,5,6, 7,8,9	CO3

		together to enhance the user experience in modern web applications.					
09	P9	**Create a Responsive image grid using Bootstrap 5.** LO1: What is JavaScript, and how is it typically used in web development? LO2: Provide examples of scenarios where JavaScript and Ajax work in tandem to create seamless and responsive web applications, highlighting their impact on user experience and data retrieval.	LOL3	L3	**2**	1,2,3,5,6, 7,8,9	C02
10	P10	**Write a JavaScript program using AJAX code and Create a web page that displays multiple elements and implement functionality to apply fading effects on these elements using jQuery.** LO1: What does Ajax stand for, and what is its primary purpose in web development? LO2: Discuss the concept of Asynchronous JavaScript and XML and how it facilitates asynchronous communication with a web server	LOL2	L3	2	1,2,3,5,6, 7,8,9	CO3

11	P11	**Create a JavaScript file (app.js) to define your AngularJS application module and controller.** LO1: What is AngularJS, and what are its key features? LO2: Discuss how AngularJS facilitates the development of dynamic and single-page web applications. Explore key features such as two-way data binding, dependency injection, and the modular structure of AngularJS applications	LOL2	L3	2	1,2,3,5,6, 7,8,9	CO3
12	P12	**Design an "AngularJS Solar System Explorer: A Design for Planet Data Visualization".** LO1: What is AngularJS, and what are its primary advantages in web development? LO2: Discuss real-world use cases where AngularJS shines in simplifying complex web development tasks. Additionally, consider the evolution of AngularJS and its position in the broader landscape of frontend frameworks and libraries.	LOL2, LOL3	-	2	1,2,3,5,6, 7,8,9	CO3
13	P13	Lab Continuous Assessment -3 of Module-3 & 4					
14	P14	Lab Continuous Assessment -4 of Module-1,2,3 & 4 (Record)					

15	P15	**Develop a mini project using react/angular.** LO1: Explore the fundamental principles and capabilities of React.js LO2: Provide examples of scenarios where React.js shines in terms of performance and code maintainability. Additionally, discuss the role of React.js in the broader landscape of frontend development and its compatibility with other technologies and libraries. Lab Continuous Assessment -6 of Module-1,2,3,4 (Mini Project)	LOL2, LOL3	-	2	1,2,3,5,6, 7,8,9	CO4

ASSESSMENT SCHEDULE FOR THEORY AND LABORATORY COMPONENT:

TABLE 6 :ASSESSMENT SCHEDULE

Sl. No.	Assessment Type	Contents	Course Outcomes	Duration In Hours	Marks	Weightage	Tentative Date
3	Mid Term Exam	Module 1, 2	CO1, CO2	1.30 Hours	**25(Th+ +25(P)**	**25%**	
2	CA1 (Surprise Test-1)	Module1	CO1	NA	5	2.5%	-
3	CA2 (Quiz/Assignment)	Module2	CO2	NA	10	5%	-
4	CA3 (Certification)	Module3,4	CO3,CO4	NA	5	2.5%	-
5	CA4 (Lab Continuous Assessment-	All Modules	CO1,CO2, CO3,CO4 & CO5	NA	5	2.5%	

	Record)						
6	CA5 (Seminar)	Module4	CO4	NA	10	5%	
7	CA6 (Mini Project)	All Modules (Including React/Angular)	CO1,CO2, CO3,CO4 & CO5	NA	15	7.5%	-
7	End Term Exam	Module 1, 2, 3, 4	CO1, CO2, CO3, CO4	3 Hours	**50(Th)+50(P)**	**50%**	

COURSE CLEARANCE CRITERIA:

AS PER ACADEMIC REGULATIONS OF THE UNIVERSITY

MAKEUP EXAM POLICY:

AS PER ACADEMIC REGULATIONS OF THE UNIVERSITY

CONTACT TIMINGS IN THE CHAMBER FOR ANY DISCUSSIONS:

University-Wide Free Hour

Sample Thought Provoking Questions For Theory Component:
TABLE 7a: Sample Thought Provoking Questions [For Theory Component]:

SNo.	Question	Marks	Course Outcome No.	Bloom's Level
1	Explain Fundamentals of Scrum Roles, Artifacts and Rituals	5	C01	**Knowledge, Comprehension**
2	Design web application for ALUMNI using HTML 5 Tags , CSS3 , Bootstrap, Angular JS	8	CO1,CO2,CO3, CO4	**Application**

Table 7b: Sample Thought Provoking Questions to be asked to Assess the Students' Preparedness to carry out the Task [For Laboratory Component] :

Sl No.	Question	Task No.	Course Outcome No.	BLOOM'S LEVE L

1	Create tiny application like adding, removing, deleting, resetting products which reflects in the total number of products into our shopping cart using React JS.	1	CO3	Apply
2	Create LinkedIn Clone Application.	2	CO3	Apply

Table 8: TARGET SET FOR COURSE OUTCOME ATTAINMENT:

Sl. No.	CO. No.	Course Outcomes	Threshold Set for the CO	Target set for attainment in percentage	Actual C.O. Attainment In Percentage*	Remarks on attainment &Measures to enhance the attainment*
1	CO1	Create a webpage using HTML5 and CSS to display a responsive layout.	70	70%		
2	CO2	Illustrate development of a responsive web.	65	65%		
3	CO3	Apply concepts of Angular.js to develop a web front-end.	60	60%		
4	CO4	Apply concepts of React.js to develop a web front-end.	65	65%		

*** TO BE FILLED AFTER END TERM EXAM WITH ACTUAL ATTAINMENT VALUES**

Signature of the Course Instructor:

This course has been duly verified Approved by the D.A.C.

Signature of the Chairperson D.A.C.

Course Completion Remarks & Self-Assessment.

REVISED TAXONOMYSAMPLE VERBS

Learning Outcomes Verbs at Each Bloom Taxonomy Level to be used for writing the course Outcomes.

TABLE 9: REFERENCE SAMPLES OF BLOOMS TAXONOMY VERBS		
Cognitive Level	Illustrative Verbs	Definitions
Remember	arrange, define, describe, duplicate, identify, label, list, match, memorize, name, order, outline, recognize, relate, recall, repeat, reproduce, select, state	remembering previously learned information
Understand	classify, convert, defend, discuss, distinguish, estimate, explain, express, extend, generalize, give example(s), identify, indicate, infer, locate, paraphrase, predict, recognize, rewrite, report, restate, review, select, summarize, translate	grasping the meaning of information
Apply	apply, change, choose, compute, demonstrate, discover, dramatize, employ, illustrate, interpret, manipulate, modify, operate, practice, predict, prepare, produce, relate schedule, show, sketch, solve, use write	applying knowledge to actual situations
Analyze	analyze, appraise, breakdown, calculate, categorize, classify, compare, contrast, criticize, derive, diagram, differentiate, discriminate, distinguish, examine, experiment, identify, illustrate, infer, interpret, model, outline, point out, question, relate, select, separate, subdivide, test	breaking down objects or ideas into simpler parts and seeing how the parts relate and are organized
Evaluate	appraise, argue, assess, choose, compare, contrast, criticize, defend, discriminate, estimate, evaluate, explain, interpret, judge, measure, predict, rank, rate, recommend, select, support, validate	rearranging component ideas into a new whole

Create	arrange, assemble, construct, collect, compose, construct, create, design, develop, formulate, integrate, manage, organize, plan, prepare, prescribe, produce, propose, specify, synthesize, write	making judgments based on internal evidence or external criteria