Course Plan

A. Course Handout

Institute/School Name	Chitkara University Institute of Engineering and Technology
Department Name	Department of Computer Science & Engineering
Programme Name	Bachelor of Engineering (B.E.), Computer Science & Engineering
Course Name	Front-End Engineering-II
Session	2024-2025
Course Code	22CS014	Semester/Batch	3rd/2023
L-T-P (Per Week)	2-0-4	Course Credits	04
Course Coordinator	Dr. Kiran Deep Singh

CLO01	Understand the fundamental concept of Web Development.
CLO02	Understand the JavaScript advance concepts, JQuery, AJAX and ReactJS to develop web pages and retrieve data from the server.
CLO03	Apply different attributes to change the layout and position of elements on web pages.
CLO04	Analyse the dynamic changes and responses using advanced web concepts.
CLO05	Design the minor project and generate report using Front End Technologies.

1. Objectives of the Course

This course covers all the emerging Web Technologies which are used by major private and public organization. The main objectives of the course are:

- To provide knowledge of Front-End Technologies like Advance JavaScript concepts, JQuery and React JS to enable students to build user friendly websites.
- To provide the required skills and project-based experience needed for entry into web design and development careers.
- To provide knowledge of variety of strategies and tools to create well-designed websites.

2. Course Learning Outcomes

After completion of the course, student should be able to:

	Course Learning Outcome	*POs	**CL	***KC	Sessions
CLO01	Understand the fundamental concept of Web Development.	PO4, PO7, PO9, PO12	K2	Factual Conceptual	18
CLO02	Understand the JavaScript advance concepts, JQuery, AJAX and ReactJS to develop web pages and retrieve data from the server.	PO1, PO3, PO6, PO8, PO9, PO11	K3	Conceptual Procedural	32
CLO03	Apply different attributes to change the layout and position of elements on web pages.	PO1, PO2, PO5, PO7, PO10	K3	Conceptual Procedural	30
CLO04	Analyse the dynamic changes and responses using advanced web concepts.	PO2, PO11, PO12	K4	Procedural	20
CLO05	Design the minor project and generate report using Front End Technologies.	PO3, PO4, PO5, PO10	K5	Conceptual Procedural	20
Total Contact Hours					**120**

Revised Bloom's Taxonomy Terminology
   * PO's available at (shorturl.at/cryzF)
   **Cognitive Level =CL
   ***Knowledge Categories = KC

Course Learning Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CLO01			M				L		H			M
CLO02	L		M			H		M	M		M	
CLO03	M	L			L		M			H		
CLO04		M									L	L
CLO05			M	M	H					L		

H=High, M=Medium, L=Low

3.   ERISE Grid Mapping

Feature Enablement	Level(1-5, 5 being highest)
Entrepreneurship	1
Research	3
Innovation	2
Skills	5
Employability	4

4.   Recommended Books:

Text Books:
B01: Learning web designing: a beginner's guide to HTML, CSS, JavaScript, and graphics by Niederst Robbins, Oreilly Publications, 2018.
BO2: Learning JavaScript by Shelley Powers, Oreilly Publications, 2006.
B03: Learning React: Functional Web Development with React and Redux, by Alex Banks, Eve Porcello, Oreilly Publications, 2015.
Reference Books:
B04: Introduction to JavaScript Object Notation by Lindsay Bassett, Oreilly Publications, 2015.
B05: Node.js, MongoDB and Angular Web Development, 2nd Edition, Brad Dayley, Brendan Dayley, Caleb Dayley, Oreilly Publications, 2017.
E-Resources:
https://library.chitkara.edu.in/subscribed-books.php

5.   Other readings and relevant websites:

Serial No	Link of Journals, Magazines, websites and Research Papers
1.	https://www.w3schools.com/jquery/
2.	https://www.javascript.com/
3.	https://reactjs.org/
4.	https://www.ics.uci.edu/~goodrich/teach/cs161/notes/

6. Recommended Tools and Platforms

React JS
Sublime Text/Notepad++/Visual Studio

7. Course Plan:

Lecture Number	Topics	Text Book
1	**Detail Discussion of Course Handout (CHO)**	
2-3	Basics of Web, History of Web, How the web works? Client Server Architecture, Front End vs Back End **Recap HTML:** HTML page structure, Basics HTML tags, Lists, Hyperlinks, Semantic Tags, Block vs Inline Elements	BO1-Chapter-2
4-5	Tables, Tags & attributes related to tables., Creating a Simple form, Input Types, different attributes of form elements, Radio button, checkbox text area, select and button. Form Attributes.	BO1-Chapter-2
6-7	**Recap CSS:** Intro to CSS, Adding styles to HTML page, Selectors, Box Model Flex and Grid, CSS Responsive Design - Viewport Meta Tags and Media Queries	BO1-Chapter-3
8-9	**Recap Bootstrap:** Intro to Bootstrap, Grid System, Breaking Points, Components, Modals, Nav & Navbar	BO1-Chapter-3
10-12	Introduction to JavaScript, Browser Dev Tools, Inserting JavaScript code in a webpage, Variables: var, let and const, variable hoisting Data Types, Operators, Interaction: alert, prompt and confirm. **Conditional Statements & Loops**	BO1-Chapter-4
13-14	**Functions:** Defining & Invoking a Function, Passing Parameters, Spread Operator, Default value of a Parameter Call-back Functions, Arrow Functions	BO2-Chapter-4
15-16	**String and its functions** **Array:** Declaring and Initializing arrays, Function of Arrays Iterating over Arrays, Predefined Iterators (for Each, map, filter, reduce)	BO4-Chapter-7 BO4-Chapter-8
Project Based Evaluation – 1 (Lecture number 1-16)	
17-18	**Object:** Creating an object, Getting values from object, iterating over objects, Nested object, arrays and objects, using for in. Object Methods	BO4-Chapter-1 BO2-Chapter-4
19-20	What is JSON? Methods of JSON. Web Storage: Local Storage and Session Storage **DOM:** Introduction to DOM, Accessing DOM, Fetching Elements from web document, Modifying elements	BO3-Chapter-5
21-22	Creating Elements, Adding/Appending Elements to the document. Changing styles of elements	BO3-Chapter-5 BO2-Chapter-6
23-24	Event Handling Mouse and Keyboard Events, Form and Control Events. Introduction to Asynchronous Programming, Event Loop Callbacks, setTimeout, setInterval	BO4-Chapter-7
25-26	Promise, Promise Chaining, Error Handling with Promises, Async and Await, Ajax and Fetch	BO4-Chapter-8
27-28	**Git:** Manage/Create GIT repository, Push & pull projects to/from remote repository.	BO3-Chapter-6
Project Based Evaluation – 2 (Lecture number 17-28)	

29-30	Introduction to React, VS Code and its environment, Webpack and its Components **JSX** Component driven approach, Class Component Vs Function Component	BO3-Chapter-5 BO3-Chapter-6
31-32	Properties in Components, Passing values from one component to another	BO2-Chapter-6
33-34	Event handling in components, List and keys State in class component, state management in class Component	BO3-Chapter-7
35-37	**NPM and router** **React Forms**	BO3-Chapter-11 BO3-Chapter-6
38-40	**Component Life Cycle** **Hooks:** useState, userEffect, useContext and useReducer	BO3-Chapter-7 BO3-Chapter-12
Final Project Based Evaluation		

8. **Delivery/Instructional Resources**

Lecture No.	Topics	Web References	Audio-Video
1	Detail Discussion of Course Handout (CHO)		
2-3	Basics of Web, History of Web, How the web works? Client Server Architecture, Front End vs Back End **Recap HTML:** HTML page structure, Basics HTML tags, Lists, Hyperlinks, Semantic Tags, Block vs Inline Elements	https://www.w3schools.com/html/html_intro.asp	https://www.youtube.com/watch?v=qz0aGYrrlhU
4-5	Tables, Tags & attributes related to tables., Creating a Simple form, Input Types, different attributes of form elements, Radio button, checkbox text area, select and button. Form Attributes.	https://www.w3schools.com/html/html_tables.asp	https://www.youtube.com/watch?v=qz0aGYrrlhU
6-7	**Recap CSS:** Intro to CSS, Adding styles to HTML page, Selectors, Box Model Flex and Grid, CSS Responsive Design - Viewport Meta Tags and Media Queries	https://www.w3schools.com/css/default.asp	https://www.youtube.com/watch?v=qKoajPPWpmo&list=PLr6-GrHUlVf8JIgLcu3sHigvQjTw_aC9C
8-9	**Recap Bootstrap:** Intro to Bootstrap, Grid System, Breaking Points, Components, Modals, Nav & Navbar	https://www.w3schools.com/bootstrap/default.asp	https://www.youtube.com/watch?v=v0IgI8vYD_o&list=PL1MK7nFniZZYRV5sign661Pq--3DbF9Bn
10-12	Introduction to JavaScript, Browser Dev Tools, Inserting JavaScript code in a webpage, Variables: var, let and const, variable hoisting Data Types, Operators, Interaction: alert, prompt and confirm. **Conditional Statements & Loops**	https://www.w3schools.com/js/default.asp	https://www.udemy.com/topic/javascript/free/

13-14	**Functions:** Defining & Invoking a Function, Passing Parameters, Spread Operator, Default value of a Parameter Call-back Functions, Arrow Functions	https://www.w3schools.com/js/js_string_methods.asp	https://www.youtube.com/watch?v=IWcUJLUAO2A
15-16	**String and its functions** **Array:** Declaring and Initializing arrays, Function of Arrays Iterating over Arrays, Predefined Iterators (for Each, map, filter, reduce)	https://www.w3schools.com/js/js_arrays.asp	https://www.youtube.com/watch?v=a_Bz5ciBHQ0
17-18	**Object:** Creating an object, Getting values from object, iterating over objects, Nested object, arrays and objects, using for in. Object Methods	https://www.w3schools.com/js/js_objects.asp	https://www.youtube.com/watch?v=VfA5VxWNkVo
19-20	What is JSON? Methods of JSON. Web Storage: Local Storage and Session Storage **DOM:** Introduction to DOM, Accessing DOM, Fetching Elements from web document, Modifying elements	https://www.w3schools.com/js/js_json.asp	https://www.youtube.com/watch?v=cj3h3Fb10QY
21-22	Creating Elements, Adding/Appending Elements to the document. Changing styles of elements	https://www.w3schools.com/html/html_form_elements.asp	https://www.youtube.com/watch?v=cj3h3Fb10QY
23-24	Event Handling Mouse and Keyboard Events, Form and Control Events. Introduction to Asynchronous Programming, Event Loop Call-backs, setTimeout, setInterval	https://www.w3schools.com/html/html_form_elements.asp	https://www.youtube.com/watch?v=cj3h3Fb10QY
25-26	Promise, Promise Chaining, Error Handling with Promises, Async and Await, Ajax and Fetch	https://www.geeksforgeeks.org/difference-between-promise-and-async-await-in-node-js/?ref=header_search	https://www.youtube.com/watch?v=RPLt3TiH6zg
27-28	**Git:** Manage/Create GIT repository, Push & pull projects to/from remote repository.	https://docs.github.com/en/get-started/using-git/pushing-commits-to-a-remote-repository	https://www.youtube.com/watch?v=3Jl3oQfZHA4
29-30	Introduction to React, VS Code and its environment, Webpack and its Components **JSX** Component driven approach, Class Component Vs Function Component	https://code.visualstudio.com/docs/nodejs/reactjs-tutorial	https://www.youtube.com/watch?v=QFaFIcGhPoM&list=PLC3y8-rFHvwgg3vaYJgHGnModB54rxOk3
31-32	Properties in Components, Passing values from one component to another	https://code.visualstudio.com/docs/setup/additional-components	https://www.youtube.com/watch?v=QFaFIcGhPoM&list=PLC3y8-rFHvwgg3vaYJgHGnModB54rxOk3
33-34	Event handling in components, List and keys State in class component, state management in class Component	https://www.w3schools.com/react/react_class.asp	https://www.youtube.com/watch?v=e2OLRdJKnEg

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| 35-37 | **NPM and router**
 React Forms | https://www.w3schools.com/react/react_router.asp | https://www.youtube.com/watch?v=1TKSmJdhHlU&list=PL5X0rgxaTIuM1NAhVEBYYdnBXxm37AJYw |
| 38-40 | **Component Life Cycle**
 Hooks: useState, userEffect, useContext and useReducer | https://www.w3schools.com/vue/vue_lifecycle-hooks.php | https://www.youtube.com/watch?v=qnN_FuFNq2g |

9. Lab Plan:

S. No.	Lab Number	Experiments	Learning Resource
1	1-2	Assignment on Book Review Blog	https://www.w3schools.com/html/html_intro.asp
2	3-5	Assignment on College Admission Form	https://www.w3schools.com/html/html_tables.asp
3	6-8	Assignment on Responsive Webpage using Bootstrap	https://www.w3schools.com/bootstrap/default.asp
4	9-12	Assignment on Chessboard	https://www.w3schools.com/js/default.asp
5	13-15	Assignment on Working with Functions	https://www.w3schools.com/js/js_string_methods.asp
6	16-18	Assignment on Create custom iterator.	https://www.w3schools.com/js/js_arrays.asp
7	19-22	Assignment on Calculate Bill	https://www.w3schools.com/js/js_objects.asp
8	23-26	Assignment on Number Generator	https://www.w3schools.com/html/html_form_elements.asp
9	27-30	Assignment on To Do App	https://www.w3schools.com/html/html_form_elements.asp
10	31-36	Assignment on Discussion App	https://www.geeksforgeeks.org/node-js-event-loop/
11	37-39	Assignment on Stopwatch and Pomodoro Clock	https://www.geeksforgeeks.org/difference-between-promise-and-async-await-in-node-js/?ref=header_search
12	40-42	Assignment on Compiling Coding Question with API	https://www.geeksforgeeks.org/how-to-fetch-data-from-json-file-and-display-in-html-table-using-jquery/?ref=header_search
13	43-44	Assignment on Display the list of users from the array.	https://code.visualstudio.com/docs/setup/additional-components
14	45-46	Assignment on Calculator using States	https://www.w3schools.com/react/react_class.asp
15	47-48	Assignment on Create dynamic route in react application and display the data based on the url/parameter passed on the webpage	https://www.w3schools.com/react/react_router.asp
16	49-50	Assignment on Stopwatch (using class component life cycle)	https://www.w3schools.com/vue/vue_lifecycle-hooks.php
17	51-60	Final project	

10. Action plan for different types of learners

Slow Learners	Average Learners	Fast Learners
• Remedial Classes on Saturdays • Encouragement for improvement using Peer Tutoring • Use of Audio and Visual Materials • Use of Real-Life Examples	• Workshops • Formative Exercises used to highlight concepts and notions • E-notes and E-exercises to read ahead of the pedagogic material.	• Engaging students to hold hands of slow learners by creating a Peer Tutoring Group • Design solutions for complex problems • Design solutions for complex problems • Presentation on topics beyond those covered in CHO

11. Evaluation Scheme & Components:

Evaluation Component	Type of Component	No. of Assessments	Weightage of Component	Mode of Assessment
Component 2	Project Based Evaluation	02*	50%	Offline
Component 3	Final Project Based Evaluation	01*	50%	Offline
Total			**100%**	

* Students will have to appear in all Project Based Evaluations.

12. Syllabus of the Course:

S. No.	Topic (s)	No. of Sessions	Weightage %
1	Basics of Web, History of Web, How the web works? Client Server Architecture, Front End vs Back End **Recap HTML:** HTML page structure, Basics HTML tags, Lists, Hyperlinks, Semantic Tags, Block vs Inline Elements **Assignment:** Book Review Blog Tables, Tags & attributes related to tables., Creating a Simple form, Input Types, different attributes of form elements, Radio button, checkbox text area, select and button. Form Attributes. **Assignment:** College Admission Form Recap CSS: Intro to CSS, Adding styles to HTML page, Selectors, Box Model Flex and Grid, CSS Responsive Design - Viewport Meta Tags and Media Queries **Recap Bootstrap:** Intro to Bootstrap, Grid System, Breaking Points, Components, Modals, Nav & Navbar **Assignment:** Responsive Webpage using Bootstrap Introduction to JavaScript, Browser Dev Tools, Inserting JavaScript code in a webpage, Variables: var, let and const, variable hoisting Data Types, Operators, Interaction: alert, prompt and confirm. **Conditional Statements & Loops** **Assignment:** Chessboard **Functions:** Defining & Invoking a Function, Passing Parameters, Spread Operator, Default value of a Parameter Call-back Functions, Arrow Functions **Assignment:** Working with Functions **String and its functions** **Array:** Declaring and Initializing arrays, Function of Arrays Iterating over Arrays, Predefined Iterators (forEach, map, filter, reduce) **Assignment:** Create custom iterator.	36	25%
	Project Based Evaluation - 1		

2	**Object:** Creating an object, Getting values from object, iterating over objects, Nested object, arrays and obects, using for in. Object Methods **Assignment:** Calculate Bill What is JSON? Methods of JSON. WebStorage: Local Storage and Session Storage **DOM:** Introduction to DOM, Accessing DOM, Fetching Elements from web document, Modifying elements Creating Elements, Adding/Appending Elements to the document. **Assignment:** Number Generator Changing styles of elements, Event Handling Mouse and Keyboard Events, Form and Control Events. **Assignment:** ToDo App **Introduction to Asynchronous Programming**, Event Loop Callbacks, setTimeout, setInterval **Assignment:** Discussion App Promise, Promise Chaining, Error Handling with Promises, Async and Await Assignment: Stopwatch and Pomodoro Clock Ajax and Fetch **Assignment:** Compiling Coding Question with API Git: Manage/Create GIT repository, Push & pull projects to/from remote repository.	36	25%
	Project Based Evaluation - 2		
3	**Introduction to React**, VS Code and its environment, Webpack and its Components **JSX** Component driven approach, Class Component Vs Function Component **Assignment:** Display the list of users from the array. Properties in Components, Passing values from one component to another Event handling in components, List and keys State in class component, state management in class Component **Assignment:** Calculator using States **NPM and router** **React Forms** **Assignment:** Create dynamic route in react application and display the data based on the url/parameter passed on the webpage **Component Life Cycle** **Hooks**: useState, userEffect, useContext and useReducer **Assignment:** Stopwatch (using class component life cycle)	28	50%
	Final Project Based Evaluation		

*As per Academic Guidelines minimum 85% attendance is required to become eligible for appearing in the End Semester Examination.

This Document is approved by:

Designation	Name	Signature
Course Coordinator	Dr. Kiran Deep Singh	
Head-Academic Delivery	Dr. Mrinal Paliwal	
Dean	Dr. Rishu Chhabra	
Dean Academics	Dr. Monit Kapoor	
Date	05.06.2024	