

## 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-I  | Session        | 2023-2024             |
| Course Code           | 23CS002  | Semester/Batch | 1 <sup>st</sup> /2023 |
| L-T-P (Per Week)      | 6-0-0  | Course Credits | 06                    |
| Course Coordinator    | Dr. Chetna Kaushal   |                |                       |

### 1. Objectives of the Course

The main objectives of the course are:

- To become proficient in developing web pages using various components like HTML, CSS, and JavaScript. By mastering these foundational technologies, students can create well-structured, interactive, and visually appealing web pages that form the backbone of modern websites and applications.
- To design front-end graphical user interfaces (GUI) that seamlessly integrate different technologies and APIs. By understanding the principles of user experience (UX) and design, learners can create intuitive, user-friendly interfaces that enhance user satisfaction and engagement.
- Understanding the current landscape of front-end technologies is essential. Learners should be able to identify the appropriate tools, frameworks, and libraries that align with specific project requirements. This knowledge empowers them to apply the right technologies effectively, solving real-life web development problems with efficiency and creativity.
- To equip learners with the necessary skills and project-based experience to enter the web design and development industry confidently. By completing various projects and gaining hands-on experience, learners will be well-prepared to pursue rewarding careers in this fast-evolving field.

### 2. Course Learning Outcomes

Student should be able to:

|              | Course Outcome  | POs           | CL               | KC   | Sessions  |
|--------------|---|---------------|------------------|--|-----------|
| <b>CLO01</b> | Analyse and construct well-structured HTML documents using various HTML tags.           | PO4,PO10,PO11 | K3,<br>K4,<br>K6 | Procedural,<br>Meta-<br>cognitive<br>Knowledge | <b>7</b>  |
| <b>CLO02</b> | Apply various styling techniques to create visually appealing and consistent web pages. | PO3, PO4      | K2,<br>K3        | Conceptual<br>Knowledge                        | <b>12</b> |
| <b>CLO03</b> | Create responsive, visually appealing, and user-friendly websites using Bootstrap.      | PO5,PO7,PO11  | K2,<br>K6        | Conceptual,<br>Meta-<br>cognitive<br>Knowledge | <b>5</b>  |

|                            |   |               |            |                                      |           |
|----------------------------|---|---------------|------------|--------------------------------------|-----------|
| <b>CLO04</b>               | Employ JavaScript to create dynamic web pages. Manipulating the Document Object Model (DOM), handling events, and implementing interactivity and form validation. | PO11,PO12     | K2, K3, K6 | Conceptual, Meta-cognitive Knowledge | <b>13</b> |
| <b>CLO05</b>               | Design user interfaces to enable advanced functionality, interactivity, animation, and/or special effects using Javascript.                                       | PO7,PO9       | K6         | Conceptual, Meta-cognitive Knowledge | <b>12</b> |
| <b>CLO06</b>               | Create responsive and interactive web applications, fetch and display data dynamically.   | PO7,PO10,PO11 | K3, K4, K6 | Conceptual, Meta-cognitive Knowledge | <b>11</b> |
| <b>Total Contact Hours</b> |   |               |            |                                      | <b>90</b> |

Revised Bloom's Taxonomy Terminology

\*Cognitive Level =CL

\*Knowledge Categories = KC

| Course Learning Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|--------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CLO01                    |     |     |     | M   |     |     |     |     |     | H    | H    |      |
| CLO02                    |     |     | M   | M   |     |     |     |     |     |      |      |      |
| CLO03                    |     |     |     |     | H   |     | M   |     |     |      | M    |      |
| CLO04                    |     |     |     |     |     |     |     |     |     |      | H    | L    |
| CLO05                    |     |     |     |     |     |     | M   |     | H   |      |      |      |
| CLO06                    |     |     |     |     |     |     | L   |     |     | M    | H    |      |

H=High, M=Medium, L=Low

### 3. ERISE Grid Mapping

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

### 4. Recommended Books

**RB1:** 'Web Enabled Commercial Application Development using HTML, JavaScript, DHTML and PHP' by Ivan Bayross, 4th Edition, BPB Publications.

**RB2:** 'The Complete Reference HTML & XHTML' by Thomas Powell, 5th Edition, Tata McGraw-Hill Company Limited.

**RB3:** 'HTML 4.0' by E. Stephen Mack, Janan Platt, Anaya Multimedia publication.

**RB4:** 'Mastering HTML, CSS & JAVAScript Web Publishing' by Laura Lemay, Rafe Coburn, Jennifer Kyrnin, 7th edition, SAMS publication.

**RB5:** 'Learning web designing: a beginner's guide to HTML, CSS, JavaScript, and web graphics' by Niederst Robbins, 4th Edition, O'Reilly Publication.

## 5. Other readings and relevant websites

| S.No. | Link of Journals, Magazines, websites and Research Papers   |
|-------|---|
| 1.    | <a href="https://developer.mozilla.org/en-US/docs/Web/HTML">https://developer.mozilla.org/en-US/docs/Web/HTML</a>   |
| 2.    | <a href="https://bennettfeely.com/flexplorer/">https://bennettfeely.com/flexplorer/</a>   |
| 3.    | <a href="https://www.codeschool.com/courses/front-end-foundations">https://www.codeschool.com/courses/front-end-foundations</a>                             |
| 4.    | <a href="https://javascript.com/">https://javascript.com/</a>   |
| 5.    | <a href="https://developer.mozilla.org/en-US/docs/Web/API/Document_Object_Model">https://developer.mozilla.org/en-US/docs/Web/API/Document_Object_Model</a> |
| 6.    | <a href="https://getbootstrap.com/">https://getbootstrap.com/</a>   |

## 6. Recommended Tools and Platforms

Any Text Editor like Notepad++, Sublime, Visual Studio Code etc.

## 7. Course Plan

| Session | Topic                       | Detailed Contents   |
|---------|-----------------------------|---|
| 1       | Getting Started with Basics | <ul style="list-style-type: none"> <li>• Welcome to Course</li> <li>• History Of Web</li> <li>• Client Server Architecture</li> <li>• Frontend and Backend</li> <li>• What Happens When You Visit a Website</li> </ul>  |
| 2-3     | Introduction to HTML        | <ul style="list-style-type: none"> <li>• HTML Page Structure</li> <li>• Title Tag</li> <li>• Basic HTML Tags</li> <li>• Unordered Lists</li> <li>• Ordered Lists</li> <li>• Adding Lists to Blog page</li> <li>• Adding Image to Blog Page</li> <li>• Adding Header To Blog Page</li> <li>• Learning Anchor Tag, Internal and External links</li> </ul> |
| 4-5     | More on HTML                | <ul style="list-style-type: none"> <li>• Div Tag</li> <li>• Semantic Tags</li> <li>• Adding Internal Links to Web Page</li> <li>• Block vs Inline Elements</li> <li>• Text Formatting Tags</li> <li>• Special Characters</li> <li>• Adding Tables</li> <li>• More Attributes and Tags Related to Table</li> </ul>                                       |
| 6-7     | Forms                       | <ul style="list-style-type: none"> <li>• Creating a Simple Form</li> <li>• Input Types</li> <li>• Attributes of form elements</li> <li>• Radio button and Checkbox</li> <li>• Select, Textarea and Button</li> <li>• Form Attributes</li> <li>• Media Tags</li> <li>• Favicon and Meta Tags</li> </ul>  |

|       |   |  |
|-------|---|--|
| 8-9   | Introduction to CSS                           | <ul style="list-style-type: none"> <li>● CSS Introduction</li> <li>● Blog Page Structure</li> <li>● Adding Styles Using CSS</li> <li>● Adding Styles Using External CSS</li> <li>● Preference of Rules</li> <li>● Chrome Dev Tools</li> <li>● Selectors types</li> <li>● Specificity of Selectors</li> <li>● Grouping and Nesting of CSS Selectors</li> </ul>                          |
| 10-11 | Styling with CSS                              | <ul style="list-style-type: none"> <li>● Adding Color</li> <li>● CSS Units</li> <li>● How to Add Border to an Element</li> <li>● Text Styling</li> <li>● Adding Background to an Element</li> <li>● Margins</li> <li>● Padding</li> <li>● Display Property</li> <li>● Aside Section of Blog Page</li> <li>● Position Property</li> <li>● Box Model</li> <li>● Min Max Width</li> </ul> |
| 12-14 | Continuous Evaluation-1<br>(Project Starting) | <ul style="list-style-type: none"> <li>● Project Intro</li> <li>● Creating HTML Structure</li> <li>● Adding Header Background image</li> <li>● Navigation</li> <li>● Adding Social Icons</li> <li>● About Section</li> </ul>   |
| 15-16 | Flex  | <ul style="list-style-type: none"> <li>● Flex Intro</li> <li>● Flex direction</li> <li>● Flex Wrap</li> <li>● Flex Grow and Flex Shrink</li> <li>● Flex justify content</li> <li>● Align content</li> <li>● Converting Resume Code to Flex</li> <li>● Resume Skills section and Heading</li> <li>● Creating Skill indicators</li> </ul>  |
| 17-18 | More on styling                               | <ul style="list-style-type: none"> <li>● Overflow-Wrap</li> <li>● Gradients</li> <li>● Link Related Pseudo Classes</li> <li>● Light-box Animation</li> <li>● Pseudo Elements</li> <li>● Using Before and After Pseudo elements</li> </ul>  |
| 19-20 | Responsive Design                             | <ul style="list-style-type: none"> <li>● What and Why of Responsive Designs</li> <li>● Different ways to make Responsive</li> <li>● Measurement Units for Responsive Designs</li> <li>● Viewport Meta Tag</li> <li>● Media Queries</li> <li>● Desktop First vs Mobile First</li> <li>● Responsiveness Check on Resume</li> <li>● Media Queries on Resume</li> </ul>                    |
| 21-23 | Animations and 3d Space                       | <ul style="list-style-type: none"> <li>● Transitions and Transforms</li> <li>● Creating a Simple Animation</li> <li>● Animation Property</li> </ul>  |

|       |   |   |
|-------|---|---|
|       |   | <ul style="list-style-type: none"> <li>• Multiple Animations</li> <li>• Animate.css</li> <li>• Starting with 3D Cube Animation</li> <li>• Building Second Face of Cube</li> </ul>   |
| 24-28 | Bootstrap                                     | <ul style="list-style-type: none"> <li>• What are Front end Frameworks</li> <li>• Getting Started with Bootstrap</li> <li>• Adding Bootstrap to your Project</li> <li>• Bootstrap Breakpoints</li> <li>• Bootstrap Grid System</li> <li>• Code Using Bootstrap Grid System</li> <li>• Margin and Display Utilities</li> <li>• Other Utility Classes</li> <li>• Bootstrap Components</li> <li>• Modals</li> <li>• Collapse Component</li> <li>• Nav</li> <li>• Navbar</li> <li>• Jumbotron Template</li> </ul> |
| 29-31 | Continuous Evaluation-2<br>(Project (contd.)) | <ul style="list-style-type: none"> <li>• Make responsive structures</li> <li>• Collab bootstrap in project</li> <li>• User animation and 3D space (as per requirement)</li> </ul>   |
| 32-36 | Starting with JavaScript                      | <ul style="list-style-type: none"> <li>• Intro to JavaScript</li> <li>• Chrome Dev Tools</li> <li>• Variables</li> <li>• Null vs Undefined</li> <li>• Operators</li> <li>• Type Coercion</li> <li>• Conditionals</li> <li>• Loops</li> <li>• Outputs</li> </ul>   |
| 37-39 | Javascript functions and Arrays               | <ul style="list-style-type: none"> <li>• Functions</li> <li>• Variable Length Arguments</li> <li>• Function Hoisting</li> <li>• Functions and Scope</li> <li>• Function within Function</li> <li>• Function Expressions</li> <li>• Function Declaration vs Expressions</li> <li>• Passing function as arguments</li> <li>• Arrays</li> <li>• Functions on Arrays</li> <li>• Splice function</li> <li>• Iterating over arrays</li> </ul>   |
| 40-43 | Object and Timing Events                      | <ul style="list-style-type: none"> <li>• Objects</li> <li>• Square Bracket Notation</li> <li>• Deleting Properties</li> <li>• How are Objects Stored</li> <li>• Iterating Over Objects</li> <li>• Nested Objects</li> <li>• Arrays and Objects</li> <li>• Iterating over array using for in</li> <li>• Timing Events</li> <li>• Countdown Timer</li> </ul>  |
| 44-46 | Understanding DOM                             | <ul style="list-style-type: none"> <li>• DOM</li> </ul>   |

|       |   |   |
|-------|---|---|
|       |   | <ul style="list-style-type: none"> <li>● Accessing DOM</li> <li>● Fetching Elements</li> <li>● Event Handling</li> <li>● Script Tag</li> <li>● External JS File</li> <li>● Other Mouse and Keyboard Events</li> <li>● Propagation of Event</li> <li>● Strict Mode</li> </ul>  |
| 47-50 | Java scripting Advanced concept/closure | <ul style="list-style-type: none"> <li>● Revising basic concept of JavaScript</li> <li>● Function Hoisting</li> <li>● Function within Function</li> <li>● Function Expressions</li> <li>● Passing function as arguments</li> <li>● Mouse and Keyboard Events</li> <li>● Propagation of Event</li> <li>● Closures, const and let</li> <li>● Let in for loops</li> <li>● Arrow Functions</li> <li>● Bindings in Arrow Function</li> </ul> |
| 51-53 | Constructors and Classes                | <ul style="list-style-type: none"> <li>● This Keyword</li> <li>● This in Strict Mode</li> <li>● Function to create Objects</li> <li>● Object constructor</li> <li>● Adding Behaviour to Objects</li> <li>● Objects</li> <li>● Class, Properties and Methods</li> <li>● Class Expressions and Hoisting</li> <li>● Exports and Imports declaration</li> </ul>   |
| 54-56 | Form Validation                         | <ul style="list-style-type: none"> <li>● Data validation and constraint validation in HTML forms</li> </ul>   |
| 57-60 | Final Project Evaluation                | <ul style="list-style-type: none"> <li>● Embed Dynamic behaviour to project</li> <li>● Generate GIT repository and share</li> </ul>   |

## 8. Delivery/Instructional Resources

| Session No. | Topics  | Web References  | Audio-Video  |
|-------------|---|---|--|
| 1-7         | Introduction to HTML, HTML Tags, Lists and Image, Forms & Validations | <a href="https://onlinecourses.swayam2.ac.in/nou20_cs05/preview">https://onlinecourses.swayam2.ac.in/nou20_cs05/preview</a><br><a href="https://developer.mozilla.org/en-US/docs/Web/HTML">https://developer.mozilla.org/en-US/docs/Web/HTML</a><br><a href="https://onlinecourses.swayam2.ac.in/aic20_sp11/unit?unit=4&amp;lesson=7">https://onlinecourses.swayam2.ac.in/aic20_sp11/unit?unit=4&amp;lesson=7</a> | <a href="https://onlinecourses.swayam2.ac.in/aic20_sp11/unit?unit=4&amp;lesson=7">https://onlinecourses.swayam2.ac.in/aic20_sp11/unit?unit=4&amp;lesson=7</a><br><a href="https://nptel.ac.in/courses/106106222">https://nptel.ac.in/courses/106106222</a> |
| 8-14        | Introduction to CSS, Styling with CSS                                 | <a href="https://developer.mozilla.org/en-US/docs/Web">https://developer.mozilla.org/en-US/docs/Web</a><br><a href="https://css-tricks.com/">https://css-tricks.com/</a>  | <a href="https://nptel.ac.in/courses/106106222">https://nptel.ac.in/courses/106106222</a><br><a href="https://www.youtube.com/watch?v=h_RftxdJTzs">https://www.youtube.com/watch?v=h_RftxdJTzs</a>   |

|       |  |  |   |
|-------|--|--|---|
| 15-31 | Flex, More on styling, Responsive Design, Animations and 3D space  | <a href="https://developer.mozilla.org/en-US/docs/Web/CSS/CSS_Flexible_Box_Layout/Basic_Concepts_of_Flexbox">https://developer.mozilla.org/en-US/docs/Web/CSS/CSS_Flexible_Box_Layout/Basic_Concepts_of_Flexbox</a><br><a href="https://bennettfeely.com/flexplorer/">https://bennettfeely.com/flexplorer/</a>                         | <a href="https://www.youtube.com/watch?v=fYq5PXgSsbE">https://www.youtube.com/watch?v=fYq5PXgSsbE</a><br><a href="https://www.youtube.com/watch?v=7kVeCqQCxIk">https://www.youtube.com/watch?v=7kVeCqQCxIk</a><br><a href="https://www.youtube.com/watch?v=JJSoEo8JSnc">https://www.youtube.com/watch?v=JJSoEo8JSnc</a> |
| 32-43 | Javascript basics, Array and Objects                               | <a href="https://developer.mozilla.org/en-US/docs/Web/JavaScript/Guide">https://developer.mozilla.org/en-US/docs/Web/JavaScript/Guide</a>  | <a href="https://nptel.ac.in/courses/106105084">https://nptel.ac.in/courses/106105084</a><br><a href="https://www.youtube.com/watch?v=qoSksQ4s_hg">https://www.youtube.com/watch?v=qoSksQ4s_hg</a>  |
| 44-46 | Understanding Document Object Model                                | <a href="https://developer.mozilla.org/en-US/docs/Web/API/Document_Object_Model">https://developer.mozilla.org/en-US/docs/Web/API/Document_Object_Model</a>  | <a href="https://nptel.ac.in/courses/106105084">https://nptel.ac.in/courses/106105084</a>   |
| 47-60 | Java scripting Advanced concept/ closure, constructors and Classes | <a href="https://developer.mozilla.org/en-US/docs/Web/JavaScript/Guide">https://developer.mozilla.org/en-US/docs/Web/JavaScript/Guide</a><br><a href="https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Classes/constructor">https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Classes/constructor</a> | <a href="https://www.youtube.com/watch?v=qoSksQ4s_hg">https://www.youtube.com/watch?v=qoSksQ4s_hg</a>   |

## 9. Evaluation Scheme & Components

| Evaluation Component | Type of Component          | No. of Assessments | Weightage of Component | Mode of Assessment |
|----------------------|----------------------------|--------------------|------------------------|--------------------|
| Component 1          | Continuous Evaluation 1*   | 01                 | 30%                    | Offline            |
|                      | Continuous Evaluation 2*   | 01                 | 30%                    | Offline            |
| Component 2          | Final Project Evaluation** | 01                 | 40%                    | Offline            |
| <b>Total</b>         |                            | <b>100%</b>        |                        |                    |

\* Continuous Evaluation is mandatory evaluation taken twice in a semester. It includes use-case designing, file work and viva.

\*\*It is mandatory evaluation including project viva, file and use-case/project designing. Further, as per Academic Guidelines minimum 75% attendance is required to become eligible for appearing in the End Semester Examination.

## 10. Syllabus of the Course

| Subject : Front End Engineering -I |  |                 |             |
|------------------------------------|--|-----------------|-------------|
| S.No.                              | Topic (s)  | No. of Sessions | Weightage % |
| 1                                  | Introduction to HTML, HTML Tags, Lists and Image, Forms & Validations, Introduction to CSS, Styling with CSS | 11              | 18%         |
| 2                                  | Flex, More on styling, Responsive Design, Animations and 3D space  | 16              | 27%         |
| 3                                  | Javascript basics, Array and Objects, Understanding Document Object Model                                    | 14              | 23%         |
| 4                                  | Java scripting Advanced concept/ closure, constructors and Classes   | 19              | 32%         |

This Document is approved by:

| Designation            | Name               | Signature |
|------------------------|--------------------|-----------|
| Course Coordinator     | Dr. Chetna Kaushal |           |
| Head-Academic Delivery | Dr. Navjeet Kaur   |           |
| Dean                   | Dr. Monit Kapoor   |           |
| Date (DD/MM/YYYY)      | 31/07/2023         |           |