Course Title: Introduction to Web Technology			
Course Code: UDS 214	**No. of credits: 2**	**L-T-P:** 20-0-20	**Learning hours: 30**
			L: Lectures**; T:** Tutorials**; P:** Practicals
Pre-requisite (if any): Fundamentals of Information Technology (UDS 104)			
Department: Natural and Applied Sciences			
Course Coordinator: Dr Priyanka Singh		**Course Instructor:**	
Contact Details:			
Course Type: Major		**Course Offered in:** Semester-4	

Course Description

This course introduces core concepts of web technologies and the Internet. It covers web architecture, HTML for document structure, CSS for styling and layout, and JavaScript for basic interactivity. Students also learn client-server communication, web hosting, domains, and responsive design. By the end of the course, students will understand how web pages are structured, styled, made interactive, and delivered across the Internet.

Course Objectives

- Understand the working principles of the Internet and the Web
- Learn to design web pages using HTML, CSS, and responsive layout methods
- Gain introductory skills in JavaScript for client-side scripting
- Familiarize with website deployment, hosting, and basic web project workflow

Course Content

Module	Topic	L	T	P
1	**Basics of Web Architecture**			
	This module introduces the fundamental structure of the World Wide Web, covering how clients and servers communicate using HTTP/HTTPS protocols. Students will learn about web browsers, URLs, DNS, and hosting environments. HTML syntax and document structure, headings, paragraphs, links, images, lists, tables, forms, semantic elements (header, nav, section, article, footer), accessibility basics, W3 Consortium Guidelines	5	-	4
2	**Client-side Scripting**			
	This module focuses on enhancing web page interactivity using JavaScript. Students will learn JavaScript syntax, variables, data types, operators, and functions. The module introduces event handling (e.g., click, submit), Document Object Model (DOM) manipulation for dynamic content updates, and basic form validation techniques. Introduction to JavaScript: JavaScript language, declaring variables, scope of variables functions, event handlers (on click, on submit etc.), Document Object Model, Form validations. Simple AJAX applications.	5		5

3	**Cascading Style Sheets (CSS)**			
	This module introduces CSS as a mechanism to control the presentation and layout of web pages. Students will learn to create stylesheets and apply styling using selectors, colors, typography, borders, margins, padding, and backgrounds. Concept of CSS, Creating Style Sheet, CSS Properties, CSS Styling, CSS Advanced (Grouping, Dimension, Display, Positioning, Floating, Align, Pseudo class, Navigation Bar, Image Sprites, Attribute sector)	5		5
4	**Server-Side Scripting**			
	This module introduces how web applications are generated dynamically on the server side. Students will learn the Model-View-Controller (MVC) architecture and the role of web servers in handling client requests. Introduction to MVC and Service Oriented Architecture (SOA), web services, web application servers, Overview on server-side programming languages (JAVA, Servlet, JSP).	5		6
	Total	**20**	**-**	**20**

Practical Sessions	Introductory hands-on with HTML web design with semantic elements	-	-	4
	Implementing simple programs in JavaScript and AJAX			5
	Programming exercises CSS and style sheets			5
	Hands-on with server-side programming languages using JAVA, Servlet, JSP	-	-	6
	Total Practical Sessions	**-**	**-**	**30**

Evaluation Criteria

- Minor Test 1: Written test [at the end of teaching of modules 1 and 2] -- 20%
- Minor Test 2: Written test [at the end of teaching of modules 3] -- 20%
- Assignment: Programming-based [including modules 1, 2, 3 and 4] -- 20%
- Major Test: Written test [including modules 1, 2, 3 and 4] -- 40%

Learning Outcomes

By the end of the course, students will be able to:

- **[Modules 1 & 2]**: Design and structure web pages using HTML and apply semantic and accessible markup practices.
- **[Modules 3]:** Style and format web content using CSS to create visually appealing and responsive layouts.
- **[Modules 1–4]**: Understand the role of server-side scripting and describe how dynamic web applications are processed using MVC architecture and JSP/Servlet concepts.

Pedagogical Approach

- Concepts introduced in lectures are immediately reinforced through real-time webpage building in class.

- Students will progress from HTML → CSS → JavaScript → Server-side concepts, applying each layer to the same website project.
- Each module concludes with a small experimental task, and a final integrated web application is developed as a course project.

Reading Resources Recommended (* = suggested readings)

- * Duckett, J. (2014). HTML & CSS: Design and Build Websites.
- * Duckett, J. (2014). JavaScript & jQuery: Interactive Front-End Web Development.
- Powell, T. (2020). HTML & CSS: The Complete Reference.
- Flanagan, D. (2020). JavaScript: The Definitive Guide (7th Ed.).

Student Responsibilities: The students are required:

- To be regular and attentive in theory classes and lab sessions
- To come prepared with readings that would be given in the theory class
- To come prepared in lab with readings from respective theory concepts taught in the class
- To submit assignments and project works on or before the deadlines

Course Designed by:

- Dr Priyanka Singh, Assistant Professor, Department of Natural and Applied Sciences, TERI School of Advanced Studies, New Delhi

Course Reviewers:

- Dr. Kamal Pandey, Scientist/Engineer - SE & Web Information Manager, Indian Institute of Remote Sensing ISRO, Dehradun
- Dr. Shiladitya Bhattacharjee, Associate Professor, School of Computer Science, UPES, Dehradun