



COMSATS University Islamabad

Department of Computer Science

Course Description Form (CDF)

Course Information

Course Code: **CSC336**

Course Title: **Web Technologies**

Credit Hours: **3(2,1)**

Lecture Hours/Week: **2**

Lab Hours/Week: **3**

Pre-Requisites: **CSC241–Object Oriented Programming**

Course Objectives

- To explain the fundamental concepts of web architectures and its applications;
- To provide an understanding of planning, designing and publishing a multi-page website;
- To provide hands-on experience of client-side technologies such as HTML, JavaScript, CSS, and React.js
- To provide practical experience in developing dynamic web applications using modern full-stack technologies

Course Contents

This course introduces the modern web technologies used for web development. Topics include Overview of Web Platforms; Web Architectures; Markup Languages; Styling; Client-Side Languages; Server-Side Technologies; Use of Databases in Web-based Applications; REST APIs; Application Security, Domain setup and Deployment.

Unit wise Major Topics:

Unit	Topic	No. of Teaching Hours
1.	Web Development: Overview, Platforms, Terminologies, Standards & Constraints, Applications Categories, and Development Environments. Tiered Web Architecture: One-Tier, Two-Tier, and N-Tier.	2
2.	Markup Languages: HTML and HTML5, Tags for headings, links, images, paragraphs and lists. Block Level vs. Inline Elements, Semantic HTML, HTML Forms	2
3.	Styling: Cascading Style Sheets (CSS), Box Model, Positioning, CSS3, Layout Design using Flex Box & Grid Box, Responsive Design, Framework Fundamentals: Bootstrap or Tailwind Framework	6
4.	Modern JavaScript (ES6+) for Web Development: Core JavaScript concepts (variables, data types, operators, scope), Functions, Closures, Important built-in methods (map, filter, reduce, forEach). DOM Manipulation, Event Handling, Regular Expressions for validation and parsing, JSON, Promise, and AJAX using Fetch API.	5
5.	Server Side Programming: Request Handling, HTTP Status Codes and Common Headers, Sessions, Cookies, Middleware, Database Connectivity with PostgreSQL or MongoDB, ORM, Response Generation using Templates, REST-API Development, Session and Token Based Authentication. Implementation using NodeJS/Express or Python/Django or FAST API.	9
6.	Front-end Development using React.js: Introduction, Rendering Approaches, Components, Event Handling, Hooks, State Management, Routing, API integration	4

7.	Application deployment and applying application level security			2	
Total Contact Hours				30	
Mapping of CLOs and PLOs					
Sr.#	Unit #	Course Learning Outcomes		Blooms Taxonomy Learning Level	PLO
CLO's for Theory					
CLO-1	1-7	Explain fundamental concepts, principles, architectures, and technologies of web development.		Understanding	2
CLO-2	2-5	Apply web development principles in designing responsive and interactive web interfaces.		Applying	4
CLO-3	4-6	Analyze approaches for developing functional client-side and server-side web applications.		Analyzing	3
CLO's for Lab					
CLO-4	2-6	Implement functional web applications using appropriate front-end and back-end technologies.		Applying	4
CLO-5	1-7	Develop functional web applications using appropriate development technologies.		Creating	5
CLO Assessment Mechanism					
Assessment Tools	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5
Quizzes	Quiz 1	Quiz 2	Quiz 3 & 4	-	-
Assignments	-	Assignment 1&2	Assignment 3&4	Lab Assignments	-
Midterm Exam	Mid Term Exam	Mid Term Exam	-	Mid Term Exam	-
Final Term Exam	Final Term Exam			-	Lab Project/ Lab Final Term Exam
Text and Reference Books					
Textbooks: 1. Web Design Playground: HTML & CSS the Interactive Way, Paul McFedries, Manning, 2019. 2. Eloquent JavaScript by Marijn Haverbeke (4th edition, 2024) 3. Learning React: Modern Patterns for Developing React Apps 2nd Edition by Alex Banks, Eve Porcello, 2020. 4. Learn React Hooks by Daniel Bugl, 2019.					
Reference Books: 1. Web Engineering, Sahil Rai, Kuk University Notes, 2020. 2. Web Programming with HTML5, CSS, and JavaScript, John Dean, Jones & Bartlett Learning 2018. 3. Murach's Modern JavaScript by Mary Delamater (2024) 4. Mastering FastAPI: Build High-Performance APIs with Python — Aimed at building scalable, high-performance APIs with advanced features. 5. FastAPI (O'Reilly).					

