

Web Engineering

Code	Credit Hours
CS-344	3-1

Course Description

This course aims to equip students with essential concepts and contemporary tools for web application development. It covers the foundational principles related to the architecture and operation of the World Wide Web as a platform, including various hosted web applications. They will gain a comprehensive understanding of the societal and cultural issues associated with these web applications, with a focus on maintaining professional and ethical practices in web development. Students will have the opportunity to build both static and dynamic websites and applications using modern tools and frameworks, including the MERN stack and LARAVEL, among others. They will also learn to apply web-focused programming languages and techniques to address real-world challenges. The course fosters the development of both individual proficiency and teamwork skills, preparing students for success in the field of web development.

Text Book:

1. Programming PHP Creating Dynamic Web Pages, Kevin Tatroe, Peter Macintyre, 4th Edition, O'Reilly, 2020
2. Web Engineering, Rajiv Chopra, Prentice-Hall of India, 2016

Reference Book/Material:

1. W3Schools (<https://www.w3schools.com/>)
2. PHP Homepage (<http://php.net/>)
3. Laravel framework (<https://laravel.com/>)
4. Node JS (<https://nodejs.org>)
5. React JS (<https://reactjs.org>)
6. Express JS (<https://expressjs.com>)

Prerequisites:

CS212 Object Oriented Programming

ASSESSMENT SYSTEM FOR THEORY

Quizzes	12%
Assignments	10%
Final Report	8%
Mid Terms	30%
ESE	40%

ASSESSMENT SYSTEM FOR LAB

Lab Assignments	70%
Project	30%

Teaching Plan

Week No	Topics	Learning Outcomes
1	Introduction to Web & Web applications	Course Introduction, Web: Definition, Internet Protocols (Layers), Client Server Model, Request Response Loop, Peer to Peer model, Role of DNS, HTTP, URLs, Web Servers
2	Client Side - Static content	HTML: Syntax, Structure, Elements, Markup, HTML Tags, nested tags, required structured tags, Doctype, Meta Tags, Divs, Images, Links, Lists, Tables, Nav Bar
3	Client Side - Static content	HTML5: Semantic Tags, Canvas, SVG, Media, APIs
4	Client Side - Content styling basics	CSS3: Syntax, Blocks, Selectors, Properties, Inline styles, Id vs class selectors, Margins, Borders, Text, Style sheets, CSS3: Media Queries, Responsive Grid, Grid layout
5	Client Side – Content styling advanced I	Box sizing, Flexbox layout, Responsive web design
6	Client Side – Dynamic content	Javascript: design, syntax, XHTML: DOM, Events, Functions, event handling
7	Client Side – Content styling advanced II	Designing with Bootstrap Layout, Components, and Utilities
8	Server Side Programming with PHP	PHP: Server side scripting concept, introduction, syntax, PHP Datatypes, loops, conditional statements, arrays
9	Mid-Semester Exam	
10	Server Side – Content generation	Super Globals (Sessions, Server, and others), Object Oriented PHP, Databases in PHP, using MySQLi and PDO, Intro to ORMs (Eloquent)
11	Server Side – Laravel Framework I	Laravel framework: Installation, configuration, directory structure, Models, Routing
12	Server side – Laravel Framework II	Controllers, Blade Layout
13	Advanced topics in Web – I (NoSQL DBs)	Intro to NoSQL, Working with MERN Stack – (MongoDB, CouchDB)
14	Advanced topics in Web – II (Frontend)	Working with MERN Stack – React JS, React JS: Front end designing, components and their lifecycle, rendering content
15	Advanced topics in Web – III (Backend)	Working with Server side – Express JS, Node JS, Backend designing, concepts, Routing, Middleware, and APIs
16-17	Advanced topics in Web – IV	Pagination Techniques, Content Management Techniques (search, download, and others)
18	ESE	

Practical:

Lab No.	Description.
Lab 01	Information acquisition from the WWW.
Lab 02	Personal Portfolio -I (Basic HTML)
Lab 03	Personal Portfolio -II (Advanced HTML)
Lab 04	Animation Widgets with CSS
Lab 05	A simple Event Calendar-I (JavaScript)
Lab 06	Open-ended Lab
Lab 07	Personal Portfolio -III (Bootstrap)
Lab 08	PHP Basics

Lab 09	Project Discussion-I
Lab 10	Project Discussion-II
Lab 11	Dynamic Web Development Using PHP
Lab 12	Attendance Recorder (Laravel)
Lab 13	Multi page, Multi role, Attendance Manager (Laravel)
Lab 14	City Search (MERN Stack)
Lab 15	Single page web application (MERN Stack)
Lab 16	Project Presentation