UIT University
DEPARTMENT OF ENGINEERING TECHNOLOGY
(Spring 2025)

Course Information

Course Title: Web Development Technologies		**Code:** SET/CET-223
Program: Bachelor of Engineering Technology (Software/Computer)	**Semester:** 4ᵗʰ	**Credit Hours:** 1+2 **Lecture:** 16 **Practical:** 28
Knowledge Area (as per HEC curriculum template)	Breadth	

1. Course description:

This course provides a comprehensive introduction to web development, covering both front-end and back-end technologies. Students will learn to design responsive websites using HTML, CSS, JavaScript, and Bootstrap, while mastering advanced front-end development with React JS. The course also covers back-end development using Node JS and Express, including database integration with MongoDB. Participants will gain practical experience in creating, testing, and deploying full-stack web applications.

2. Course Objective:

- Build responsive websites using HTML, CSS, JavaScript, and Bootstrap.
- Develop dynamic, component-based front-end applications with React JS.
- Understand routing, DOM access, and state management in React.
- Create and manage servers, routes, and databases using Node JS and MongoDB.
- Perform CRUD operations and test APIs using Postman.
- Learn domain registration, website hosting, and deployment processes.

3. Course Learning Outcomes (CLOs):

CLO No.	CLO Description	Domain and Taxonomy level	PLO mapped (i to xii)	Level of emphasis of the PLO (1=High; 2=Medium; 3=Low)
1.	Recite, define, and explain the main concepts of the web and client-side web development.	C4	i	2
2.	Understand common web technologies and design patterns to connect them together	C2	i	2
3.	Use some of the development languages, frameworks and reusable services in order to manipulate information on the World Wide Web.	P2	v	2
4.	Build client-side web applications that are scalable flexible to modify and easy to manage.	P3	iv	2

*Note:

C → Cognitive, P → Psychomotor, A → Affective domains and 'n' is the taxonomy level.
✓ It is strongly suggested that one CLO should be mapped to one PLO and one domain only.

THEORY LECTURE BREAKDOWN

4. Weekly Lecture Breakdown

Week #	Topic(s) to be covered	CLO #
1	Introduction to Web Development	1
2	Understanding Internet Basics, Web Communication, Website Planning	1
3	Web-Site Design Principles, Client-Side Programming	1
4	Introduction to HTML, HTML tags and attributes, Creating a simple webpage, Forms and input types, Multimedia elements (audio, video, etc.)	1
5	Basic CSS concepts (selectors, properties, values) Styling HTML elements, Box model and layout techniques	1
6	JavaScript basics (Basics)	1
7	JavaScript basics (Variables , data types and Operators)	1
8	JavaScript basics (Functions)	1
9	Control structures, DOM manipulation	2
10	PHP Scripts	
11	Backend Development with Node.js, Introduction to Node.js and its ecosystem	2
12	Installing Node.js and setting up a development environment	2
13	Connecting to NoSQL Databases (MongoDB) : Introduction to MongoDB, Setting up a MongoDB database,	2
14	CRUD operations using Mongoose	2
15	Testing and Debugging	2
16	Hosting Your Application	2

Lab-work Plan

5. Experiment/Practical Breakdown

Experiment #	Experiment Title	CLO #
1	HTML Fundamentals	3
2	HTML5 Multimedia Integration and Tables: Audio Video Elements & Tables	3
3	HTML Forms and Validation Techniques	3
4	Creating a Web Layout with HTML and CSS	3
5	Creating the Responsive Designs with CSS Flexbox and Grid	4
6	Styling and Animating Web Pages with CSS	4
7	JavaScript Fundamentals: Understanding Variables, Data Types, and Control Structures	3
8	Advanced JavaScript: Functions & DOM Manipulation with JavaScript	3
9	Building a Functional Calculator with HTML, CSS, and JavaScript	4
10	Open Ended Activity - I	4
11	Bootstrap Basics: Responsive Layouts and Components	3
12	Advanced Bootstrap: Customization and JavaScript Components	3
13	Building a Webpage with HTML, CSS, JavaScript, and Bootstrap	4
14	Open Ended Activity - II	4
15	Designing of landing Web page	4
16	Installation of XAMPP Server & Deploying Your Web Application on Localhost	3
17	Introduction to React JS: Building Your First Component	3
18	React JS - II	3
19	Building an Application with React JS	4
20	Open Ended Activity – III	4
21	Introduction to PHP Scripts	3
22	PHP Scripts -II	3
23	Introduction to MongoDB: Installation and Configuration	3
24	Performing CRUD Operations in MongoDB	3
25	Introduction to WordPress Development	3
26	Developing an E-Commerce Website Using WordPress	4
27	Open-Ended Activity - IV	4

28	Lab Project	4

6. Syllabus and Books:

- Web Technology: Theory and Practice 1st Edition by Akshi Kumar (2018) ISBN-13: 978-1138550438 or latest edition
- Web Programming with HTML, CSS, Bootstrap, JavaScript, jQuery, PHP, and MySQL by Larry Sanchez (2017) ISBN-13: 978-1542604758 or latest edition.
- HTML 5, CSS 3 & Bootstrap 4 All-in-One: a complete introduction to front end web development by Mike Ludo (2019) ISBN-13: 978-1777026769 or latest edition
- Wieruch, R. (2017). The road to react: Your journey to master plain yet pragmatic react. js. Robin Wieruch. Tsonev, K. (2015). Node. js by example. Packt Publishing Ltd or latest edition

7. Percentage of theoretical background, problems analysis and solution design

Elements covered in the course	*Percentage of full course coverage*
Theoretical background	30%
Problem analysis	35%
Solution design	35%

8. Teaching and learning methods:
   a. Lecture
   b. Class discussion/ Videos
   c. Presentation
   d. Activities
   e. Homework

9. Student assessment methods:
   a. Quiz
   b. Assignment
   c. Exams (Theory)
   d. Presentation
   e. Project
   f. Activities etc.

10. Assessment schedule:
   a. Quiz   throughout the semester
   b. Assignment   throughout the semester
   c. Exams
      Midterm exam   Week   9
      Final theory exam Week   18
   d. Presentation   Week   11,17
   e. Activities   Week   4,8,15,16

11. Weighting of assessments:

Theory:
- a. Quizzes/Activities   10 Marks
- b. Assignments/Presentation   20 Marks
- c. Midterm examination   20 Marks
- d. Final term examination   50 Marks

   Total   **100 Marks**

Lab:
- a. Lab Sessional   20 Marks
- b. Lab Examination   30 Marks

   Total   **50 Marks**

12. Facilities required for teaching and learning
- a. Computer Usage
- b. Software
- c. Online board + online ppt writing
- d. YouTube

Course group leader name:

Engr. Bilal Iqbal

S. No.	Course group member (if any)	Theory/Lab	Signature
1	Engr. Bilal Iqbal	Theory & Lab	

Recommended by the Program Coordinator	Verified by the department Chairperson

Endorsed By the Dean of the Faculty	Approved by Provost

Program Learning Outcomes (Bachelor of Engineering Technology Program):

(i) **Engineering Technology Knowledge (SA1)**: An ability to apply knowledge of mathematics, natural science, Engineering Technology fundamentals and Engineering Technology specialization to defined and applied Engineering Technology procedures, processes, systems or methodologies.

(ii) **Problem Analysis (SA2)**: An ability to Identify, formulate, research literature and analyze broadly defined Engineering Technology problems reaching substantiated conclusions using analytical tools appropriate to the discipline or area of specialization.

(iii) **Design/Development of Solutions (SA3)**: An ability to design solutions for broadly-defined Engineering Technology problems and contribute to the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

(iv) **Investigation (SA4)**: An ability to conduct investigations of broadly-defined problems; locate, search and select relevant data from codes, data bases and literature, design and conduct experiments to provide valid conclusions.

(v) **Modern Tool Usage (SA5)**: An ability to Select and apply appropriate techniques, resources, and modern technology and IT tools, including prediction and modelling, to broadly-defined Engineering Technology problems, with an understanding of the limitations.

(vi) **The Engineering Technologist and Society (SA6)**: An ability to demonstrate understanding of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to Engineering Technology practice and solutions to broadly defined Engineering Technology problems.

(vii) **Environment and Sustainability (SA7)**: An ability to understand and evaluate the sustainability and impact of Engineering Technology work in the solution of broadly defined Engineering Technology problems in societal and environmental contexts.

(viii) **Ethics (SA8)**: Understand and commit to professional ethics and responsibilities and norms of Engineering Technology practice

(ix) **Individual and Team Work (SA9)**: An ability to Function effectively as an individual, and as a member or leader in diverse teams.

(x) **Communication (SA10)**: An ability to communicate effectively on broadly defined Engineering Technology activities with the Engineering Technologist community and with society at large, by being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

(xi) **Project Management (SA11)**: An ability to demonstrate knowledge and understanding of Engineering Technology management principles and apply these to one's own work, as a member or leader in a team and to manage projects in multidisciplinary environments.

(xii) **Lifelong Learning (SA12)**: An ability to recognize the need for, and have the ability to engage in independent and life-long learning in specialist Engineering Technologies.