



**COURSE CONTENT**

WEB AND SHELL APPLICATIONS								
<b>IV Semester : ECE</b>								
Course Code	Category	Hours/ Week			Credits	Maximum Marks		
2546676	SDC	L	T	P	C	CIA	SEE	Total
		0	0	2	1	40	60	100
<b>Contact Classes: Nil</b>		<b>Tutorial Classes: Nil</b>		<b>Practical Classes:30</b>			<b>TotalClasses:30</b>	
<b>Prerequisites: Object Oriented Programming through JAVA</b>								

**Course Overview:**

This course introduces Linux operating systems, web technologies, and application development through practical lab activities. Students learn Linux installation, filesystem management, permissions, processes, and shell scripting, along with HTML, CSS, basic servers, and databases. The course also covers Node.js and Flutter for web and mobile app development, providing hands-on experience in system administration and full-stack fundamentals.

**Course Outcomes:** After Completion of the course, students should be able to:

- **CO1:** Understand Linux system structure, OS architecture, and command-line environment.
- **CO2:** Perform Linux installation and basic administration including file, user, and permission management.
- **CO3:** Develop shell scripts to automate tasks such as backups, monitoring, and data processing.
- **CO4:** Use Linux tools for software management, networking, and service configuration.
- **CO5:** Implement backup, recovery, and basic troubleshooting techniques through practical labs.

**1.Introduction to OS Concepts and Web**

**Lab Activity:** Linux History, Opensource software basics & Licenses, Why Linux vs windows Identify system and application software on your PC. Differentiate their roles and explain basic OS functions.

Understand web architecture, clients, servers, and workflows. Explore an existing website's structure and elements using browser Dev Tools.

**2.Linux Architecture & Kernel Types**

**Lab Activity:** Compare Monolithic and Microkernel architectures using diagrams. Discuss how Linux's structure supports device-level control.

Installing Linux (Ubuntu/CentOS)

**Lab Activity:** Install Linux using VirtualBox or WSL. Document each installation step and troubleshoot any permission or hardware issues.

### **3.Linux Filesystem & Navigation**

**Lab Activity:** Navigate key directories like /home, /etc, and /var. Create folder structures for a team project.

### **4.File Permissions & Ownership**

**Lab Activity:** Set permissions on project folders so only group members can access/edit them. Verify permissions using multiple users.

User and Group Management

**Lab Activity:** Create users and groups for a coding team. Set up shared access using group permissions and configure hidden config files.

### **5.Process Management**

**Lab Activity:** Identify and terminate frozen or unresponsive processes during compilation using commands like ps and top.

### **6. Shell Scripting Basics**

**Use Case:** *System Info Script for Lab Login*

**Lab Activity:**

Create a shell script that automatically displays system uptime, current date/time, available disk space, and active users each time a lab user logs in. Use variables and echo statements to present the information in a readable format.

### **7.HTML Basics**

Learn about different markup languages and their significance. Create a homepage for a static site using paragraphs, headings, lists, links, and images.

### **8.CSS – Layout & Design Foundations**

Apply colors, spacing, and layouts using CSS. Practice Flexbox and Grid techniques by cloning a simple website layout.

### **9.Basic Server Concepts & Node.js**

Set up a basic Node.js server to serve web content. Understand server-side fundamentals and simple routing.

### **10.Introduction to Databases**

Learn to store and retrieve data using JSON or SQLite. Save contact form submissions from your portfolio into a database, confirmation messages , management application integrating both web and mobile interfaces.

### **11. Introduction to Flutter**

Understand Flutter's widget structure and framework basics. Design a simple login and landing page for a mobile app.

Create a Flutter app that displays a list of events. Add RSVP functionality with confirmation messages.

## REFERENCE BOOKS:

1. Jon Duckett, Beginning HTML, XHTML, CSS, and JavaScript, Wrox Publications, 2010.
2. Bryan Basham, Kathy Sierra and Bert Bates, Head First Servlets and JSP, O'Reilly Media, 2nd Edition, 2008.
3. Vasan Subramanian, Pro MERN Stack, Full Stack Web App Development with Mongo, Express, React, and Node ,2nd Edition, APress.

## ELECTRONIC RESOURCES:

1. <https://developer.mozilla.org/en-US/>
2. <https://css-tricks.com/snippets/css/a-guide-to-flexbox/>
3. <https://getbootstrap.com/docs/5.0/getting-started/introduction/>
4. <https://www.freecodecamp.org/learn/responsive-web-design/>
5. <https://javascript.info/>

## MATERIALS ONLINE:

1. Open-ended experiments
2. Lab Manual

