SEMESTER-I

MAJOR - III

Course Title: **Web Development with JavaScript (T)**	Course Code : **13C**
Semester**: I**	Course Group : **M-III**
Teaching Scheme in Hrs. (L: T: P): **4:1:0**	Credits : **5**
Map Code: **NA**	Total Contact Hours : **75 Hrs.**
CIA: **25 Marks**	ESE : **75 Marks**
Programme: **MSc CS**	

No.	Course Outcome	PSOs	Cl. Ses	CL
CO1	Demonstrate key web programming concepts	PSO1, PSO2	15	AP
CO2	Make web applications using JavaScript, HTML, and CSS	PSO1, PSO2	15	AP
CO3	Implement user interactions on web pages	PSO1, PSO2	15	AP
CO4	Implement UI components for web applications	PSO1, PSO2	15	AP
CO5	Use code management tools such as GitHub	PSO1, PSO1	15	AP

UNIT – I **15 Hours**

Computational Thinking: Introduction To Computing (What Is A Computer And Restaurant Example) - Getting Started With HTML (Create A Web Document Using HTML) - Working with Styles (Creating Shapes In HTML And Shapes Exercise) - Bootstrap Styles (Introduction To Bootstrap) - Variables in JavaScript (Variables And Variables Code Exercise) – Arrays (Arrays And Arrays Code Exercise) - Conditional Statements (Conditional Statements And Conditional Statements Exercise) – Loops (Loops And Loops Exercise) – Functions - Functions: Working with Libraries (Functions - Libraries, Code And Loops Exercise) - Functions: Arrays (Functions - Array Exercise) - Functions : Objects (Functions : Objects Exercise) - Computational Thinking (Computational Thinking Summary) – Simulation (Simulation - Scheduling Computation) - Scheduling Repeating Computation (Simulation - Scheduling Repeating Computation) - Maintaining State - Moving in Time and Space - One Dimensional Motion and Animation -

Moving In Time And Space: Two Dimensional Motion (Edge Detection And 2D animation Edge Detection) - Coding Challenge (Bonus Exercise).

UNIT – II **15 Hours**

Mental Model of Computing Operations: Mental Model Of A Computer - Thinking Through The Mental Model Of A Computer (Points To Remember When Coding) - Basic Data Types (Basic Data Types In JavaScript) - Scope Of Variables (Scope Of Variables In JavaScript) - Equals Operator - Passing Primitive Types Into Functions (Primitive Types: Pass By Value Into Function) - Passing Objects And Arrays Into Functions (Objects And Arrays Passed By Objects Into Function And Passed By Reference) - Passing Functions Into Other Functions - Passing Functions Into Other Functions (Pass And Fire Function) - Casting Types - Function Declaration Vs. Function Expression (Model Factory And Hoisting Functions And Vars) - Debugging In The Console To Understand Code Execution (Debugging In Chrome) - Debugging Basics - Debugging Exercises - Graphics Animation Of Projectiles And Random Walk Exercise - Big Bang Exercise.

Introduction to JavaScript: Variables (Introduction to Variables and Programming in JavaScript) - Arrays and Objects (First Array and First Object) - Block Scope (Block Scope of Let) - Function Calls with Primitive Types Vs. Objects for Arguments (Function Call with Argument and Function Call with Object for Argument) - Passing Arguments To Functions By Value And By Reference (Pass By Value - Pass By Reference) - Basic Looping (Basic Looping And Looping On Array Exercise) - Looping to Add Elements (Looping On Array Exercise) - PacMan Exercise (Introduction To PacMan Exercise And PacMan Exercise)

UNIT – III **15 Hours**

Functions: Array Manipulation and Scope: Array Manipulation (Introduction to Array and String Manipulation and Array Manipulation Functions) - String Manipulation (String Manipulation Functions and String Template Literals) - Anonymous Functions (Anonymous Functions and Fat Arrows) - Function and Block Scope (Scope of Variables) - Passing Functions by Reference - ES6 Modules (ES6 Module Demo and Module Pattern) - Walk Boston Exercise (Introduction to Walk Boston Exercise and Boston City Data)

Callback Functions: Callback Functions (Callbacks Introduction and Callback) - For Each Element in an Array (For Each Element in an Array and for Each Exercise) - Filter Callback (Filter Callback and Filter Exercise) - Sort Callback (Sort Exercise and Sort and Chart Salaries) - Map Callback- Reduce Function (Reduce) - Word Count Exercise

UNIT – IV **15 Hours**

Introduction to GitHub, Testing, And the DOM: GitHub Install with Keys (GitHub Install) - Introduction to The GitHub Cycle (Introduction to The GitHub Cycle and GitHub Cycle) - VS Code GitHub Integration - Introduction to Testing (Introduction to Testing and What Is Testing?) - Installing Node.js - Testing Hello World (Testing The Hello World Exercise) - The World Wide Web and Tim Berners Lee - Introduction to The Document Object Model - Injecting JavaScript into HTML Web Pages - The Document Object Model - Dynamically Inject Posts into Div- Render Using Fetch - PacMen Factory Exercise (Introduction to The PacMen Exercise and Factory for PacMen)

Styles And Bootstrap: Introduction to Styles - HTML, CSS, And JavaScript (Three Languages: HTML, CSS, And JavaScript, Separating HTML, CSS, And JavaScript Into Different Files) - Styling with Class (Styling With Class, CSS - Inheritance, Selectors, and What Matters The Most (At Least, to Your Browser)) - Controlling the Layout Using CSS Grid (Control Layout Using CSS Grid And Understanding Grid Lines) - Holy Grail (Holy Grail, Resources) - Bootstrap Styles - Styling Fonts (Font Basics And Web Fonts) - Applying Styles Programmatically to Create Dynamic Pages (Applying Styles Programmatically) - Coding Challenge: Styling Programmatically (Styling The Grid Programmatically And Animated Style Application, Bringing It All Together) - Eye Movement Exercise - Working with CSS Reflection (Solutions).

UNIT – V **15 Hours**

Asynchronous Code: Asynchronous Code (Introduction to Asynchronous Code and What is Asynchronous Code?) – Promises - Async and Await - Async in The Browser (Async in The Modern Browser and Performance Budget) - Mapping Exercise (Map Hello World and Map Markers) - Mapping Visualizations (Map Clustering and Heat Maps) - Map Animation (Map Animation and Real-Time Bus Tracker)

Introduction to Cyber Security and Recursion: Agile Methodology - Introduction to Cybersecurity - What Is Open SSL? - Cybersecurity - Encryption, Kerberos, And PKI & PKI Keys - Hash Demo Blockies and Create Your Own Blockie - Introduction to Recursion - Permute String and Permute Exercise - Rotate Image - Rotate Matrix Exercise - Tower of Hanoi Exercise.

REFERENCES

1. Full Stack Development with MERN- MIT

2. JavaScript for Kids: A Playful Introduction to Programming | December 12, 2014|Nick Morgan
3. JavaScript Patterns: Build Better Applications with Coding and Design Patterns | First Edition| Stoyan Stefanov
4. Eloquent JavaScript, 3rd Edition: A Modern Introduction to Programming | Third Edition | Marjin Haverbeke
5. https://javascriptweekly.com/
6. https://2020.stateofjs.com/en-US/
7. https://github.com/lydiahallie/javascript-questions#readme
8. https://edabit.com/challenges/javascript