SEMESTER-I MAJOR - III

Course Title: Web Development with JavaScript			
Semester: I			
Teaching Scheme in Hrs. (L: T: P): 4:1:0	Credits : 5		
	Total Contact Hours: 75 Hrs.		
Formative Assessment: 25 Marks	Summative Assessment (SEE): 75		
	Marks		
Programme: MSc CS # - Semester End Exam			

No.	Course Outcome	POs & PSOs	Cl. Ses	CL
CO1	Explain key web programming concepts	PO1 - PO4, PSO1, PSO2	10L +2T	AP
CO2	Build web applications using JavaScript, HTML, and CSS	PO1-PO4, PSO1, PSO2	10L + 3T	AP
CO3	Design and code user interactions on web pages	PO1-PO4, PSO1, PSO2	10L + 3T	АР
CO4	Design and implement UI components for web applications	PO1-PO4, PSO1, PSO2	10L + 3T	AP
CO5	Define and breakdown modern software development lifecycle processes	PO1-PO4, PSO1, PSO2	10L + 2T	АР
CO6	Set-up code management tools such as GitHub	PO1, PSO1	10L + 2T	АР

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