SEMESTER-I

MAJOR-2

Course Title : **Web Development with JavaScript**	Course Code :
Semester : **I**	Course Group : **NA**
Teaching Scheme in Hrs (L:T:P) : **3:2:6**	Credits : **8 Credits**
Map Code: **NA**	Total Contact Hours : **165**
Formative Assessment : **25 Marks**	Summative Assessment(SEE) : **75 Marks**
Programme: **MCA**	**# - Semester End Exam**

No.	Course Outcome	POs & PSOs	Cl. Ses	CL
CO1	Explain key web programming concepts	PO1-PO4, PSO1, PSO2	9L + 6T + 18P	AP
CO2	Build web applications using JavaScript, HTML, and CSS	PO1-PO4, PSO1, PSO2	9L + 6T + 18P	AP
CO3	Design and code user interactions on web pages	PO1-PO4, PSO1, PSO2	9L + 6T + 18P	AP
CO4	Design and implement UI components for web applications	PO1-PO4, PSO1, PSO2	9L + 6T + 18P	AP
CO5	Define and breakdown modern software development lifecycle processes	PO1-PO4, PSO1, PSO2	6L + 4T + 12P	AP
CO6	Set-up code management tools such as GitHub	PO1-PO4, PSO1, PSO2	3L + 2T + 6P	AP

PEDAGOGY:

Lecture, Group Discussion, LCD, Seminar and Case Study.

UNIT – I **25 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 **35 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 **35 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 **35 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 **35 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