

SOFTWARE DEVELOPMENT CURRICULUM

Draft V.1.0

Contents

Month One	3
INTRODUCTION TO WEB DEVELOPMENT	3
HTML.....	3
CSS.....	3
Project Phase One	4
Month Two	4
JavaScript	4
Databases.....	4
Project Phase Two	5
Month Three	6
Advanced JavaScript.....	6
Project Phase 3.....	6
Month Four	6
Microsoft Power BI.....	6
Microsoft Navision (Microsoft Dynamics 365 Business Central):	7
Month Five	7
ReactJS	7
Module 1: Introduction to ReactJS.....	7
Module 2: React Router and Single-Page Applications	7
Module 3: Managing State with Redux.....	7
Module 4: Forms and Form Validation.....	8
Module 5: React Hooks	8
Module 6: React and API Integration	8
Month Six	8
Java.....	8

Month One

INTRODUCTION TO WEB DEVELOPMENT

1. Understanding the web
2. Front-end vs. back-end development
3. Essential web development tools
4. Setting up a development environment

HTML

1. Introduction to HTML
 - Basics of HTML
 - HTML tags, elements, and attributes
 - Document structure, headings, paragraphs, and text formatting
2. HTML Forms and Input
 - Creating forms
 - Text fields, checkboxes, radio buttons, dropdown menus
 - Form validation and submission
3. HTML Semantics and Multimedia
 - Semantic HTML and its importance
 - Semantic elements: header, nav, section, article, footer
 - Multimedia elements: images, audio, video
4. HTML Tables and Layouts
 - Creating tables
 - Table headers, rows, and columns
 - Layouts using div containers, positioning, and responsive design.

CSS

1. Introduction to CSS
 - CSS selectors, properties, and values
 - Inline, internal, and external stylesheets
2. CSS Box Model and Layout
 - CSS box model: margins, borders, padding, content
 - Element positioning and layout using display, float, position, flexbox.
3. CSS Styling and Selectors
 - Styling text, backgrounds, links, lists, tables
 - CSS selectors: classes, IDs, pseudo-classes

- CSS animations and transitions
- 4. CSS Responsive Design
 - Responsive web design using media queries.
 - Designing navigation menus, grids, and images for different devices
 - Mobile-first design and optimization for mobile devices

Project Phase One

- Choose a project.
- Use Pure HTML and CSS

Month Two

JavaScript

1. Introduction to JavaScript
 - Basics of JavaScript programming
 - Variables, data types, and operators
 - Control structures: conditionals and loops
2. Functions and Scope
 - Declaring and invoking functions
 - Function parameters and return values.
 - Scope and variable hoisting
3. Arrays and Objects
 - Working with arrays: accessing, modifying, and iterating
 - Objects: creating, accessing properties, and object methods
 - JSON (JavaScript Object Notation)
4. DOM Manipulation
 - Introduction to the Document Object Model (DOM)
 - Selecting and modifying HTML elements
 - Handling events: event listeners and event propagation

Databases

1. Introduction to Databases
 - What is a database?
 - Types of databases (relational, non-relational, etc.)
 - Importance of databases in software development.
2. Relational Databases
 - Introduction to relational databases.
 - Tables, rows, and columns.
 - Primary keys and foreign keys.
 - SQL basics: querying, filtering, and sorting data.
3. Database Design
 - Entity-Relationship (ER) modeling.
 - Normalization: reducing redundancy and improving data integrity.
 - Creating database schemas.
4. Data Manipulation
 - Inserting data into tables.

- Updating and deleting data.
- Retrieving data with SQL queries.
- 5. Relational Database Management Systems (RDBMS)
 - Introduction to popular RDBMS (e.g., MySQL, PostgreSQL, Oracle).
 - Installation and setup.
 - Using graphical interfaces and command-line tools.
- 6. Non-Relational Databases
 - Introduction to non-relational databases (e.g., MongoDB, Cassandra).
 - Understanding document-oriented and key-value stores.
 - Basics of NoSQL querying.
- 7. Data Modeling
 - Understanding data models and schemas.
 - Entity relationships in databases.
 - Choosing the appropriate data model for different scenarios.
- 8. Database Integration
 - Connecting databases to applications.
 - Working with database APIs and drivers.
 - Performing database operations from software applications.

Project Phase Two

Build on Project phase one: HTML, CSS, and JavaScript

Month Three

Advanced JavaScript

1. Asynchronous JavaScript
 - Introduction to asynchronous programming
 - Callback functions and the event loop
 - Promises and async/await syntax.
2. Error Handling and Debugging
 - Handling runtime errors with try...catch statements.
 - Debugging techniques: console.log, breakpoints, and browser tools
 - Error types and common debugging scenarios
3. JavaScript Modules
 - Introduction to modular JavaScript
 - Exporting and importing modules
 - Module bundlers: Webpack, Rollup, and Babel
4. JavaScript and APIs
 - Working with RESTful APIs: making HTTP requests
 - Parsing and manipulating JSON data
 - Authentication and authorization

Project Phase 3

Connect your existing project to a database.

Use some advanced JS

Month Four

Microsoft Power BI

1. Introduction to Power BI
2. Connecting to Data Sources
3. Data Transformation and Modeling
4. Creating Visualizations
5. Working with Power BI Desktop
6. Sharing and Collaborating with Power BI Service
7. Power BI DAX (Data Analysis Expressions)

8. Power BI Reports and Dashboards
9. Power BI Mobile App
10. Power BI Best Practices

Microsoft Navision (Microsoft Dynamics 365 Business Central):

1. Introduction to Microsoft Navision
2. Understanding the User Interface
3. Working with Sales and Marketing Modules
4. Managing Inventory and Warehouse
5. Financial Management in Navision
6. Purchase and Vendor Management
7. Production and Manufacturing Processes
8. Business Intelligence and Reporting in Navision
9. Security and User Administration
10. Navision Customization and Extensions

Month Five

ReactJS

Module 1: Introduction to ReactJS

1. Introduction to ReactJS
2. Setting up the development environment
3. JSX syntax and components
4. State and props
5. Event handling in React
6. Component lifecycle

Module 2: React Router and Single-Page Applications

1. Introduction to React Router
2. Setting up routes in React
3. Navigating between routes
4. Route parameters and query strings
5. Implementing nested routes
6. Handling redirects

Module 3: Managing State with Redux

1. Introduction to Redux
2. Redux store, actions, and reducers

3. Connecting React components to Redux
4. Dispatching actions and updating state
5. Asynchronous actions with Redux Thunk
6. Using selectors for data retrieval

Module 4: Forms and Form Validation

1. Controlled and uncontrolled components
2. Handling form input and submission
3. Form validation with libraries like Formik or Yup
4. Displaying validation errors
5. Working with form libraries like React Hook Form

Module 5: React Hooks

1. Introduction to React Hooks
2. useState for managing state
3. useEffect for lifecycle management
4. Custom hooks and reusable logic
5. useContext for state management across components

Module 6: React and API Integration

1. Making API requests with Axios or Fetch
2. Handling API responses and errors
3. Data fetching with useEffect
4. Displaying API data in React components
5. Pagination and infinite scrolling

Project: Build a simple ReactJs Project

Month Six

Java

Fundamentals:

1. Introduction to Java and its ecosystem
2. Setting up the development environment
3. Variables, data types, and operators
4. Control flow statements (if-else, loops)
5. Methods and functions
6. Arrays and collections
7. Object-oriented programming basics (classes, objects, inheritance)
8. Exception handling
9. Input and output operations
10. Basic file handling

