AccioJob’s Full Stack Developer Course — Curriculum

Data Structures & Algorithms

📌 MODULE • **Fundamental Programming Constructs**

Programming 101

1. Flowcharts
2. Variables and Data types
3. Conditional statements
4. Loops and Functions
5. While loops
6. Patterns using loops

7. Functions

Intro to Arrays

1. Introduction to arrays
2. How arrays are stored in memory
3. Passing arrays to functions

Searching and Sorting Algorithms

1. Binary Search
2. Selection sort
3. Bubble sort
4. Insertion sort
5. Merge Sort
6. Quick Sort

Strings and 2D Arrays

1. Introduction and Practice Problems of 2D arrays
2. Introduction to Strings and Inbuilt Functions

Time and Space Complexity

1. Order complexity analysis
2. Theoretical complexity analysis
3. Time complexity analysis of searching and recursive algorithms
4. Theoretical space complexity

Recursion

1. Introduction to recursion
2. Principle of mathematical induction. Understanding base case.
3. Time and space complexity analysis in recursion
4. Recursion using arrays, Backtracking

📌 MODULE • **Linear Data Structures & Algorithms**

Object Oriented Programming

1. Creating objects
2. Constructors and related concepts
3. Abstraction
4. Encapsulation
5. Inheritance
6. Polymorphism
7. Virtual functions
8. Abstract classes
9. Exception handling

Linked Lists

1. Singly Linked Lists
2. Doubly Linked Lists
3. Circular Linked Lists

Stacks and Queues

1. Introduction to stacks
2. Dynamic Stack class
3. Inbuilt stack
4. Queue using arrays
5. Inbuilt queue

📌 MODULE • **CS DeepDive**

Intro to Trees

1. Generic Trees
2. Binary Trees
3. Binary Search Trees

Hashing

1. Hashing as a concept
2. Chaining
3. Inbuilt hash-maps in Java
4. Hash functions
5. Collision handling
6. Load factor
7. Rehashing

DBMS

1. Architecture
2. Relation Models
3. Normalization
4. Indexing, B, B+ Trees

Operating Systems

1. System Structure
2. CPU Scheduling
3. DeadLock
4. Memory Management

Networking

1. Basics
2. Data Link Layer
3. Network Layer
4. Transport Layer
5. Application Layer
6. Network Security and Cryptography

DSA Projects

Projects using data structures and Algorithms will be covered.

📌 MODULE• **System Design & Graph-based Data Structures**

Priority Queue

1. Introduction to heaps
2. Implementing priority queues
3. Heap sort
4. Inbuilt Priority Queue

Graphs

1. Graph Terminologies and Traversals (DFS and BFS)
2. Weighted and Directed Graphs
3. Minimum Spanning Trees
4. Dijkstra's algorithm

Dynamic Programming

1. Introduction to Memoization
2. Top down Approach
3. Bottom up Approach

Frontend Development Curriculum

📌 MODULE • **Static Frontend Programming & JS first steps**

HTML- Tags & Attributes

1. Div/Span, Classes/IDs, Semantic Tags, DIFF TYPES of input tags, typography tags for paragraphs, headings & span.
2. Intro to HTML Tables
3. Post-Class Homework- Revise the concepts to get cleared with the basics.

Tables & Forms

1. Tables for layouts
2. HTML Forms
3. Contact me forms

CSS Basics

1. Intro to CSS
2. Inline, Internal, External CSS

CSS Specificity, Combinators, Float & Clear

1. CSS specificity and CSS Combinators
2. Box modal and CSS position
3. Display property
4. CSS typography

CSS flex & CSS grid

1. CSS flex, CSS grid & Media query

Bootstrap

1. Introduction to bootstrap

Bootstrap Layouts & Components

1. Bootstrap layouts like Cards
2. GRID(VIMP), Carousel, typography
3. Bootstrap components and classes

JavaScript Intro & DOM

1. JS Intro, DOM, Attributes and styles
2. Variables, Data types, Conditions
3. Re-declaration

JS Operators

1. Arithmetic operators & Relational operators
2. JS: Var
3. Hoisting, Temporal Dead Zone
4. JS Strings

📌 MODULE • **Javascript 0 to 1**

JS Events & Objects

1. Object Properties and Methods
2. For in, For of
3. Object Constructors

Primitive and non-primitive data types

1. Data types
2. Properties & Methods

Array methods & ES6 syntaxes

1. .filter, .map methods
2. ES6 Syntaxes
3. JS- Reduce

Error handling & Asynchronous JS

1. JS- Error handling and throw keyword
2. Intro to Asynchronous JS
3. SetTimeout, setInterval

JS- Call back & Promises

1. Callback Hell
2. Promises Intro

Promise Chaining

1. JS- Promise Chaining
2. Promise.any, Promise.all

Call Stack

1. Call Stack
2. Task Queue
3. Event Loop
4. Validations

📌 MODULE • **Modern Frontend Frameworks**

React JS

1. React JS intro

2. React: Folder Structure
3. Nesting Components
4. Grouping & Sass Intro

React Props & Virtual Dom

1. React: Props, Default props
2. setState, Virtual Dom
3. Event Handling

Rendering Loops

1. React- Rendering Loops
2. Mounting & Unmounting Life Cycle

Hooks & React Router

1. Hooks - useEffect, useState
2. React Router,
3. SPA & useParams
4. Fallback Route
5. Higher-Order Function

Redux

1. Action Creator, Action Payload
2. Multiple Reducers & Combine Reducers
3. mapStateToProps & mapDispatchToProps
4. Advance Counter Redux

Backend Development Curriculum

📌 MODULE • **Building backends using modern frameworks**

Intro to Node and Express - Backend System

1. Intro to backend - Client Server Architecture
2. Why a single backend
3. Components in Backend System

Web APIs

1. Intro to Web APIs
2. Web API Usages
3. Popular Web APIs
4. Why Web APIs

Node - Single Threaded Js, Asynchronous Behaviour

1. Intro to Node.js
2. SingleThreaded JS and Async Behavior
3. Setting Up Node
4. Advantages of Node.js
5. Working Demo - Running Node environment

NPM - Package Manager and Usage

1. Intro to npm
2. Package.json and npm
3. Express - Server and Express Server
4. Intro to Express.js
5. Advantages of Express.js
6. Working Demo

TP: Status codes, Testing using postman

1. Status Codes, Postman, Demo of each API method, Testing using Postman
2. **Storage**: Intro to Storage, File Storage, Databases
3. **Databases**: Intro and Types, Advantages over file system, Demo Using SQL, Demo Using MongoDB, CRUD OPs

Authentication

1. Intro to Authentication
2. How Auth works
3. Token based auth
4. Session based auth demo
5. JWT
6. Client Server token verification

To do App

1. Session based Auth, Cruds Ops implementation, EJS, Axios
2. Optimising todo app: Optimising DB Calls, Reiterating the APIs, Pagination, Need, Usage
3. Implementation on Todo App: Rate Limiting, Need, Usage, Security Point of View
4. Hosting Todo App - Hosting the app on heroku
5. SQL: Intro, Vertically Scalable, Query Processing

Intro to MongoDb

1. Intro to noSQL DBs
2. Horizontally Scalable
3. ORM - Mongoose
4. NoSQL Functions
5. Aggregate Operations

Database Normalisation, Joins, Indexing, Caching

1. Intro, 1NF, 2NF, 3NF, Checking Schema for normal forms on Todo App
2. Joins: Intro, Types (Left, Right, Inner, Outer)
3. Indexing: Idea, Types, Usage, Implementation on TodoApp
4. Caching Db: Need, Usage, Examples, Advantages and Disadvantages, Lazy Loading,Intro, Examples and Advantages
5. Pooling: Intro, Usage, Disadvantages

File system

1. Sockets: Intro, Example messaging system design and implementation, Advantages
2. File System (Fs module): Read Write, Streaming a file

Create a Blogging web app backend from scratch