Cloud Computing

# C0. Preparatory Course

Fundamentals of Programming Languages with Basic Data Structures

Learning the fundamentals of C# and its basic building blocks.

# C1. Toolkit for Experiential Learning

Abstraction and Encapsulation

Inheritance and Polymorphism

Arrays, ArrayList, Environment Set up

# C2. Experiential Learning

Requirement Identification

Assignment on Requirement Identification

Design and Prototyping

Assignment on Design and Prototyping

Module level Implementation and Unit Testing

Assignment on Module level Implementation

Integration and Testing

# C3. Object Oriented Design & Software Engineering

SDLC and Agile Methodology

Object Oriented Design

Testing and Version Control

Assignment on **Object-Oriented Analysis and Design (**OOAD)

# C4. Data Structures and Algorithms

Algorithm Analysis and Recursion

Searching & Sorting (Divide & Conquer)

Stacks and Queues

Sets and Dictionaries (HashTable, Trees & BST, Heaps)

Graphs and Graph Algorithms

Mandatory Assignment on above

Greedy and Dynamic Programming

Interview Skills

# C5. Distributed Systems and Cloud Databases

* **Introduction to Distributed Systems:**

Understanding Distributed Systems: what it is, why it is needed, its characteristics and a few industry examples, understanding challenges in implementing Distributed System and CAP theorem.

* **Introduction to Cloud and AWS:**

Understanding the different Cloud related concepts and terminologies and getting introduced to some of the services offered by AWS

* **SQL and Relational Database Management Systems:**

Get introduced the Relational Database Management System and learn about the techniques to module relational databases. Use SQL to perform various DML and DDL queries on the relational database

* **Hands on with NoSQL – MongoDB:**

Understanding the notion of NoSQL Database, take hands-on approach and learn model and query using MongoDB

* **Assignment on Databases**

Use the concept learn so far and work on industry grade project

# C6. Design and Development of Microservices

* **Introduction to .Net Core and MVC**

Get introduced to .Net Core and create application using it.

* **Data Access Layer and Service Layer**

Take hands on approach and learn how to build data and service layer in your application.

* **Introduction to Backend Architectures**

Get introduced to web application, the various types of software backend architectures and learn about their use cases and challenges.

* **Designing Applications using Microservices**

Create a high-level design and decompose a given monolithic application to a microservice based architecture.

* **REST and Controller Layer**

Get introduced to REST and understand its various intricacies to develop REST APIs.

* **AOP, Exception Handling and Application Security**

Get introduced to Aspect Oriented Programming. Learn about the various concepts of Exception Handling and application security.

* **Discovery and Communications between Microservices**

Establish synchronous communication between microservices, and manage these services for registry, discovery, load balancing and API gateway.

* **Asynchronous Communications using Messaging Models**

Analyse various messaging patterns and deep dive into Kafka to establish asynchronous communication for given use case.

* **Course Project: Hotel Room Booking Application**

Create a microservice based application to evaluate the knowledge acquired throughout the course.

# C7. Serverless Development and Deployment of Cloud-Native Applications

Introduction to Serverless Architecture & AWS Lambda

Web Application Optimization

Microservices – Debugging and Troubleshooting

Dotnet on AWS (Dotnet offerings on AWS Cloud)

Application Deployment using Docker

Deploying Containers at Scale using Kubernetes

Deploying Web Applications with Elastic Beanstalk

Course Project: Application Deployment using Docker

# C8. CAPSTONE

Capstone Project: Book My Consultation Application