SDE Bootcamp
Software Development Engineer

Overview

This program is designed to educate the students with the best skill sets, tools, and strategies to be an enterprise-level Software Development Engineer with a focus on Full Stack Development.

The instructors of this course are working IT professionals that are currently working as Software Developer in leading IT companies.

The class will meet online two times a week. Students are expected to spend about 15-20 hours/week studying the materials for the best outcomes.

Program Outcomes: A graduate student should have the following abilities:

1. Understand and practice a complete Software Development Life Cycle methodology using Agile-Scrum.
2. Understand basic technologies and enterprise tool suite.
3. Write the enterprise-level Java Program, a complete understanding of Object-Oriented Programming, validation, and important third-party libraries.
4. Develop Microservices for both RESTful and SOAP services using Spring Boot.
5. Understand Structured Query Language (SQL), Data persistent technologies, relational and non-relational databases.
6. Develop applications with enterprise-level security.
7. Develop applications to solve different enterprise-level problems such as Batch Processing of data and Messaging Queue.
8. Develop User Interface with one of the most popular Javascript frameworks.
9. Develop Unit, Integration, and User Interface test with Selenium, Rest-assured Junit, Mockito, and others.
10. Understand the Software Testing process and write Test Plans and documentation.
11. Understanding of CI/CD Pipeline Automation using Jenkins.
12. Understand and explain how enterprise multi-tiered applications are developed and work.

Technologies: Java, Spring Boot, React, Redux, SQL, RESTful, SOAP, JUnit, Mockito, RestAssured, JavaScript, CSS, HTML, Selenium WebDriver, Unix, Git, Docker, CI/CD, Jenkins, Cloud, IntelliJ, Eclipse, VS Code, Professional Career Service

Estimated Length: 9 months

Module 1: SDLC and Technology Basics

Software Development Lifecycle 101

Lesson	Outcomes
SDLC	● Understand different Software Development Life Cycles ● Understand traditional SDLC methodologies such as Waterfall, Iterative, etc.
Agile & Scaled Agile Framework	● Understand Agile methodology ● Understand Agile Scrum methodologies and best practices ● Understand Scaled Agile ● Practice Agile Ceremonies
Project Management Tools	● Hands-on experience of enterprise-level tool suite for project management: JIRA, Scrum Board, Wiki/Confluence, etc. ● Create JIRA issues, manage defects and workflows

Technology Basics 101

Lesson	Outcomes
Hardware, Software Networks - IoT, Servers, Virtual Machines (VM), Cloud, VPN, Docker Internet Safety	● Deep understanding of enterprise-level hardware and software ● Understand different kinds of applications ● How to better utilize the internet safely in an enterprise work environment
Unix and Windows Commands	● Dig dipper with commands, finding logs, creating and manipulating text using VI editors

Module 2: Database, SQL, and Manual Testing

Structured Query Language 101

Lesson	Outcomes
Structured Query Language (SQL)	● Understand SQL functions, aggregators, data

	types, relations ● Data retrieval, update, and insertion process ● Familiar with database user-defined functions, triggers, Indexes, etc ● Practice queries and stored procedure calls
Database tools and types	● Use SQL Developer ● Exposure to popular databases: MySQL, PostgreSQL, MongoDB as NoSQL

Software Testing 101

Lesson	Outcomes
STLC	● Understand the Software Testing Life Cycle ● Bug LifeCycle
Manual Testing	● Write and execute manual Test cases ● Prepare Test Plans, Scenarios, and review. ● Defect tracking, logging, and retest ● Understand different types of testing: Regression, Smoke, Retest, End to End, etc

Module 3: Java Programming - Create a Payroll Application

Source Code Management and Version Control System

Lesson	Outcomes
Version Control Systems (VCS)	● Understand popular VCS: Git and SVN ● Understand the VCS concept and importance
Git	● Clone, branch, merge, pull, push, cherry-picking, and conflict resolution

Java Programming 101

Lesson	Outcomes
IDE	● Introduction to popular IDEs: Intellij, Eclipse, etc. ● IDE installation and environment preparation
Java Fundamentals	● Understand JDK, JRE, JVM ● Class, Objects, fields, variables, methods, and functions

	● Data Types, Control flows, Operators, Logics, and Looping
Object-Oriented Programming	● Encapsulation ● Abstraction ● Inheritance ● Polymorphism
Exception Handling	● Handle checked and unchecked exceptions
Advanced Java, Collection Framework and Third-Party Libraries	● Learn important use of Java Collection framework and other third party libraries ● Lambda ● File System Manipulation (IO) ● MultiThreading and Memory Management ● Use ReadMe.md for project documentation
Build Tools	Maven and Gradle

Module 3 Project 1: Develop Java Application

Module 4: Back-End Development with Spring Framework

Develop Microservices Application with Spring and SpringBoot 201

Lesson	Outcomes
RESTful and SOAP Services	● Data Transfer over HTTP/HTTPS ● HTTP Verbs ● JSON data type ● XML data type
Spring Core Container	● Understand Spring Beans ● Understand the Spring Context and Core ● Understand Expression Language ● Tomcat Servlet Container
Spring Web	● Understand Servlet ● Spring Web ● Thymeleaf
Data Access/Integration	● JDBC ● ORM: Hibernate ● Transaction Management ● MyBatis ● JdbcTemplate

Spring Boot & Micro Services	● Develop RESTful Service ● Develop a SOAP Service ● Spring Data JPA
Spring Security	● Handle Authorization and Authentication ● Implement role-based authorization
Other	● Logging ● Messaging Queue ● Documentation with swagger ● Spring Batch and Scheduler ● Implement validation and Error Handling
Testing	● Unit Testing with Junit, Mockito ● Manual Testing with PostMan, SOAPUI ● Integration Testing with Rest-assured

Module 4 Project: Build Spring Boot Application with Testing Framework

Module 5: Front-End Development with React

Develop User Interface with React 101

Lesson	Outcomes

Browser, Javascript, ES6, and DOM	● HTML and CSS basics
	● Understand browser and it's component
	● Javascript Basic
	  ○ DataTypes, variables, conditionals, loops, functions, arrays, objects
	● Object-Oriented Javascript
	● ES6 features
	  ○ Template string, destructuring, scoping, arrow function, async-await, etc.
	● Document Object Model (DOM)

Develop User Interface with React 201

Lesson	Outcomes

React, Material UI, and Redux	● React Fundamentals
	  ○ Rendering UI
	  ○ State and Props
	  ○ Lifecycle Management
	  ○ React Router
	● Redux for state management

Automate UI Testing with Selenium	Create UI Test framework with Selenium PageObject Model

Module 5 Project 1: Build a UI
Module 5 Project 2: Selenium

Module 6: DevOps in Test Automation

DevOps

Lesson	Outcomes
Pipeline CI/CD concepts	● Understand the pipeline, CI/CD concepts, and how enterprises use them
Jenkins	● Set up Jenkins roles, plugins ● Schedule jobs, monitoring, automated emails with test results and other notifications

Module 7: Professional Career Service

Professional Career Development

Lesson	Outcomes
Resume Review	● Review and refine Resume ● Review GitHub, StackOverflow, and LinkedIn Profiles
Job Search Strategies	● Crafting Cover Letter ● Conducting Job Search ● Job site activities ● Networking and Meetups
Mock Interviews	● Virtual Interview. ● 1-1 interview. ● Panel Interview.