SDET Nanodegree

Software Development Engineer in Test

Overview

The intent of this program is to teach the prospective students with the best and latest skill sets, tools and strategies to be an enterprise-level Software Development Engineer in Test.

The students will meet online and/or in-person three times a week (8hrs/week) with the instructors who are currently working as Senior and Lead Engineers in leading IT companies. 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 such as Agile-Scrum.
2. Implement Software Testing process including writing and enhancing Test Case strategies, Test Planning, Test Documentations, and Reporting.
3. Understand the core concepts of Software, Hardware, Networks, Back-end and User Interface.
4. Write enterprise-level Java Program, a complete understanding of Object-Oriented Programming, validation and important third-party libraries.
5. Create a new Selenium Test framework with BDD and enhanced capabilities of parallel execution from the Selenium Grid environment.
6. Ability to enhance existing Automation Frameworks of Selenium and REST API.
7. Understanding of CI/CD Pipeline Automation using Jenkins.

Estimated Length: 6 months

Module 1: SDLC and STLC Basics

Software Development Lifecycle 101

Lesson	Outcomes
SDLC	• Understand different Software Development Life Cycles. • Understand traditional SDLC methodologies such as Waterfall, Iterative, etc.
Agile	• Understand Agile methodology. • Understand Agile Scrum methodologies and best practices.
Process Management Tools	• Hands-on experience of enterprise-level tool suite for project management: JIRA, Scrum Board, Wiki, etc.

Technology Basics 101

Lesson	Outcomes
Browser • Extension • Dev Tools	• Deep understanding of how the browser works. How to utilize the browser's debugger and other inbuilt components.
Enterprise Technologies • Hardware, Software • Protocol - HTTP, Verbs • HTML • CSS • Networks, Servers, VPN • Internet Safety	• Deep understanding of enterprise-level hardware and software. • Understand the underlying mechanism of HTTP and how to interpret HTTP verbs. • Understand HTML, CSS and their contribution to the User Interface. • 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.

Software Testing 101

Lesson	Outcomes
STLC	• Understand the Software Testing Life Cycle.
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.
Reporting	• Write Test Result report and communicate to the management.
Top 10 OWASP and Compliance Testing	• Understanding the basics of Security Testing. • Understand different compliance testing.

Due: Module 1 Lab

Module 2: Database and SQL

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, Constrains, etc.
Database tools and types	• Use SQL Developer. • Exposure to popular databases: MySQL, PostgreSQL, MongoDB as NoSQL.

Due: Module 2 Lab

Module 3: Java Programming - Create a Payroll Application

Source Code Management and Version Control

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 (OOP)	• Abstraction • Polymorphism • Inheritance • Encapsulation
Exception Handling	• Handle checked and unchecked exceptions.
Build Tools	• Understand the importance of build tool. • Adopt Maven build tool. • Familiar with the Gradle build tool.
Collection Framework and Third-Party Libraries	• Learn important use of Java Collection framework: List, Set, Map, etc. • Java third-party libraries.

Due: Module 3 Project

Module 4: Test Automation

Test Automation Basic and User Interface Testing 101

Lesson	Outcomes
Test Automation Process	• Understand what and when to automate. • Strategize the Test Automation implementation. • Analyze the Application Under Test and select the proper test automation framework.
Java Test Frameworks	• Understand the need of Test Frameworks, types of Automated Test: Unit, Integration, and End to End.
Selenium WebDriver	• Set up the framework with Maven. • Implement the Page Object Design Pattern. • Refactor and learn best practices. • Report on UI Test Suite.
Selenium Grid and Remote WebDriver	• Understand the need for parallel Test Execution. • Use Selenium Grid for faster feedback.

Due: Module 4 Project 1

Test Automation (API and Performance) 201

Lesson	Outcomes
Data transfer strategies	• Understand common data types and payloads: JSON, XML.
Web Services	• REST API & SOAP Services. • Understand different tools in the market: Postman & SoapUI.
Performance Testing	• Understand the JMeter for API and Performance Testing.

Due: Module 4 Project 2

Test Automation (BDD) 301

Lesson	Outcomes
Cucumber	• Understand BDD. • Hook up Cucumber to exiting Test Framework. • Implement Parallel Test Execution using Cucumber.
Serenity and Reporting	• Create Test Result report using Serenity.

Due: Module 4 Project 3

Module 5: DevOps in Test Automation

DevOps

Lesson	Outcomes
Pipeline & CI/CD concepts	• Understand the pipeline, CI/CD concepts and how enterprise utilize them.
Jenkins	• Setup Jenkins Pipeline. • Configure Jenkins' roles & plugins. • Schedule jobs, monitoring, automated emails with test results and other notifications.

Due: Module 5 Project

Module 6: Professional Career and Job Placement Prep.

Professional Career Development

Lesson	Outcomes
Resume Review	• Review and refine Resume. • Review GitHub, Stack Overflow, 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.