SDET Nanodegree

Software Development Engineer in Test

Overview

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

The students will meet online/in-person three times a week (8 hrs/week) together with valuable instructions from engineers who are currently working as a Senior and Lead Engineer in different IT scopes. 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, and Test Documentations.
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 – 8hrs

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

Technology Basics 101 - 24 hrs

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	• Deep understanding of enterprise-level hardware and software.

• HTML • CSS • Networks - IoT, Servers, VPN • Internet Safety	• Understand the underlying mechanism of HTTP and how to interpret HTTP verbs. • Understand HTML, CSS and their contribution to User Interface. • How to better utilize internet safely in enterprise work environment
Unix and Windows Commands	• Dig dipper with commands, finding logs, creating and manipulating text using VI editors.

Software Testing 101 - 16 hrs

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

Due: Module 1 Lab

Module 2: Database and SQL

Structured Query Language 101 - 16 hrs

Lesson	Outcomes
Structured Query Language	• Understand SQL functions, aggregators, data types, relations. • Data retrieval, update and insertion process. • Familiar with database user defined functions, triggers, Indexes etc.
Database tools and types	• Use SQL Developer • Exposure to popular databases: MySQL, PostgreSQL, MongoDB as NoSQL.
Reporting	• Write Test Result report and communicate to the management.
Top 10 OWASP and Compliance Testing	• Understanding basics of Security Testing • Understand different compliance testing.

Due: Module 2 Lab

Module 3: Java Programming - Create a Payroll Application

Source Code Management and Version Control - 4 hrs

Lesson	Outcomes
Version Control Systems	• 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 - 48 hrs

Lesson	Outcomes
IDE	• Introduction to popular Java 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
Collection Framework and Third Party Libraries	• Lean important use of Java Collection framework and other third party libraries.

Due: Module 3 Project

Module 4: Test Automation

Test Automation Basic and User Interface Testing 101 - 48 hrs

Lesson	Outcomes
Test Automation Process	• Understand what to automate and when to automate. • Strategize the Test Automation implementation. • Analyze the Application Under Test and select proper framework.
Java Test Frameworks	• Understand the need of Test Frameworks, types of Automated Test: Unit, Integration, End2end.
Selenium WebDriver	• Set up framework, build tool (maven). • Implement Page Object Design Pattern. • Refactoring and learn best practices. • Reporting on UI Test Suite.
Selenium Grid and RemoteWebDriver	• Understand the need of parallel Test Execution. • Use Selenium Grid for faster feedback.

Due: Module 4 Project 1

Test Automation (API and Performance) 201 - 8 hrs

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

Due: Module 4 Project 2

Test Automation (BDD) 301 - 16 hrs

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

Due: Module 4 Project 3

Module 5: DevOps in Test Automation

DevOps - 8 hrs

Lesson	Outcomes
Pipeline, CI/CD concepts	• Understand the pipeline, CI/CD and enterprise use of them.
Jenkins	• Set up 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 - 16 hrs

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