GlobeTech Academy Catalog

2024 Edition

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Diploma in Software Quality Engineer (SQE)

Course Overview

The Diploma in Software Quality Engineer(SQE) is designed to provide students with a comprehensive understanding of software quality assurance and testing methodologies. This program covers a wide range of topics, including manual and automated testing, Agile and Scrum practices, business analysis, project management, and various testing tools and techniques. The curriculum is structured to build foundational knowledge and progressively advance to more complex topics, ensuring students are well-prepared for the demands of the industry.

Course Outcomes

Upon completion of this diploma, students will be able to:

Understand Software Quality Principles: Grasp the fundamentals of software quality, including quality assurance and quality control, and their importance in the software development life cycle.

Apply Testing Techniques: Utilize various testing techniques such as unit, integration, system, and acceptance testing, and design effective test cases.

Implement Agile and Scrum Practices: Integrate Agile methodologies and Scrum practices into software development projects, including managing sprints and backlogs.

Conduct Business Analysis: Perform business analysis tasks, including requirements gathering, use case development, and stakeholder communication.

Utilize DevOps Tools: Implement Azure DevOps for continuous integration and delivery and manage projects using JIRA and ALM.

Perform Manual and Automated Testing: Execute manual testing processes and develop automated test scripts using tools like Selenium.

Conduct API and Performance Testing: Test APIs using tools like Postman and SoapUI and perform performance testing using JMeter.

Manage Projects: Apply project management principles, including planning, risk management, and resource allocation, using tools like MS Project and Trello.

Administer SQL Server Databases: Manage and maintain SQL Server databases, ensuring data integrity, performance, and security.

Analyze Data with Power BI: Create and share data visualizations and reports using Power BI.

Designing and implementing robust cloud solutions: Gather knowledge and skills necessary to become proficient AWS Cloud Solution Architects, capable of

Complete a Capstone Project: Apply learned concepts to a real-world project, demonstrating the ability to collaborate and present findings effectively.

Potential Job Roles

Graduates of this program can pursue various roles in the software quality engineering field, including:

- **Software Quality Assurance (SQA):** Ensuring software products meet quality standards through various testing procedures1.
- **Test Automation Engineer:** Developing and executing automated test scripts to improve testing efficiency.
- **Quality Analyst:** Analyzing and reporting on software quality metrics and identifying areas for improvement.
- **Business Analyst:** Gathering and documenting requirements and communicating with stakeholders to ensure project success.
- **Project Manager:** Planning, executing, and closing projects, managing resources, and ensuring project goals are met.
- **DevOps Engineer:** Implementing continuous integration and delivery pipelines and managing development and operations processes.

- **API Tester:** Testing and validating APIs to ensure they meet functional and performance requirements.
- **Performance Tester:** Conducting performance tests to identify bottlenecks and optimize software performance.
- **Mobile Tester:** Testing mobile applications on various devices and platforms to ensure functionality and usability.
- **Database Administrator:** Managing and maintaining database systems, ensuring data integrity, performance, and security.
- **Scrum Master:** Facilitating Scrum ceremonies, coaching Agile teams, and ensuring the Scrum process is followed effectively.
- **Project Manager:** Plan, schedule and manage the Software Projects with Projrct Management tools.
- **Cloud Practitioner:** Design secure, scalable, and cost-effective cloud architectures and implement AWS solutions

The **Diploma in Software Quality Engineer(SQE)** course is designed to be completed in **60 weeks(Part Time)**, with a total of **600 clock hours**. Each week consists of **10 hours** of study, combining both theory and lab work. If someone wants to do **Certification**, he/she can attend specific courses to get the Certification instead of Diploma.

> **Total Hours**
>   * **Core Modules:** 480 clock hours
>   * **Elective Module:** 120 clock hours (choose any 3 Elective)
> **Total Program Hours:** 600 clock hours

==Curriculum Breakdown==

Core Modules (480 hours)

Module 1: Introduction to Software Quality Engineer (24 hours)

- **Week 1-2**: Fundamentals of Software Quality

    o **Clock Hours**: 24 hours theory, 0 hours lab

    o Definition and importance of software quality

    o Quality assurance vs. quality control

    o Software development life cycle (SDLC)

    o **Software Testing Life Cycle (STLC)**

- ▪ Phases of STLC (requirement analysis, test planning, test case development, environment setup, test execution, test cycle closure)

- ▪ Entry and exit criteria for each phase

- ▪ Deliverables and documentation in STLC

  o Role of a software quality engineer

Module 2: Software Testing Principles and Techniques (24 hours)

- **Week 3-4**: Testing Fundamentals

  o **Clock Hours**: 24 hours theory, 0 hours lab

  o Types of testing (unit, integration, system, acceptance)

  o Black-box vs. white-box testing

  o Static vs. dynamic testing

  o Test case design techniques

Module 3: Agile and Scrum Practices (30 hours)

- **Week 5-8**: Agile and Scrum Fundamentals

  o **Clock Hours**: 20 hours theory, 10 hours lab

  o Agile methodologies (Scrum, Kanban)

  o Role of QA in Agile teams

  o Scrum ceremonies (sprint planning, daily stand-ups, sprint reviews, retrospectives)

  o Writing user stories and managing product backlogs

  o Role and responsibilities of a Scrum Master

  o Facilitating Scrum ceremonies

  o Coaching Agile teams

  o Preparing for Scrum Master certification exams

Module 4: Business Analysis (48 hours)

- **Week 9-13**: Business Analysis Fundamentals

  o **Clock Hours**: 24 hours theory, 24 hours lab

  o Role of a business analyst in software projects

- o Requirements gathering and documentation

- o Use case and user story development

- o Stakeholder communication and management

- o Preparing for ISTQB Business Analyst certification exams

Module 5: Azure DevOps (40 hours)

- **Week 14-17**: Azure DevOps Basics

  - o **Clock Hours**: 16 hours theory, 24 hours lab

  - o Introduction to Azure DevOps

  - o Setting up Azure Boards for Scrum

  - o Managing sprints and backlogs

  - o Continuous integration and delivery (CI/CD) with Azure Pipelines

Module 6: Quality Management and Metrics (24 hours)

- **Week 18-20**: Quality Management and Metrics

  - o **Clock Hours**: 16 hours theory, 8 hours lab

  - o Key quality metrics (e.g., defect density, test coverage)

  - o Reporting and documentation

  - o Root cause analysis

  - o Using metrics to drive improvements

Module 7: Software Quality Assurance Manual Testing (44 hours)

- **Week 21-24**: Manual Testing Basics

  - o **Clock Hours**: 24 hours theory, 20 hours lab

  - o Introduction to manual testing

  - o Writing and executing test cases

  - o Defect lifecycle and management

  - o Tools for manual testing (e.g., JIRA, ALM)

  - o **Defect and Reporting**

    - Defect identification and classification

- Defect tracking and lifecycle
- Reporting defects using JIRA and ALM
- Generating and analyzing defect reports

- **Test Case Management Tools**
  - Introduction to test case management tools (e.g., TestRail, Zephyr, Qmetry)
  - Creating and managing test cases
  - Linking test cases to requirements and defects
  - Test execution and reporting

- Preparing for ISTQB Foundation Level Tester certification exams

Module 8: JIRA/ALM (40 hours)

- **Week 25-28**: JIRA and QMetry Integration
  - **Clock Hours**: 16 hours theory, 24 hours lab
  - Introduction to JIRA /ALM
  - Setting up and managing projects in JIRA
  - Integrating JIRA with QMatry for defect tracking and test management
  - **Integrating JIRA with Qmetry**
    - Introduction to Qmetry
    - Configuring JIRA with QMetry using credentials or Open API key
    - Real-time synchronization of user stories between JIRA and QMetry
    - Managing test cases, executions, and defects with QMetry in JIRA
  - Best practices for using JIRA/ALM in software quality assurance

Module 9: Java Programming (40 hours)

- **Week 29-32**: Java Basics
  - **Clock Hours**: 24 hours theory, 16 hours lab
  - Introduction to Java
  - Object-oriented programming concepts
  - Writing and debugging Java code

o Java for test automation

Module 10: Test Automation with Selenium (46 hours)

- **Week 33-36**: Selenium Basics

  o **Clock Hours**: 16 hours theory, 30 hours lab

  o Introduction to Selenium WebDriver

  o Setting up Selenium with Java

  o Writing and executing Selenium test scripts

  o Advanced Selenium features (e.g., handling alerts, frames, and windows)

  o **Maven, GIT, and Jenkins**

    ▪ Introduction to Maven for project management and build automation

    ▪ Using GIT for version control

    ▪ Setting up and configuring Jenkins for continuous integration and continuous delivery (CI/CD)

    ▪ Integrating Selenium with Maven, GIT, and Jenkins for automated testing pipelines

Module 11: SQL Server (40 hours)

- **Week 37-40**: SQL Server Basics

  o **Clock Hours**: 16 hours theory, 24 hours lab

  o Introduction to SQL Server

  o Database design and normalization

  o SQL Server set up and configuration

  o Writing SQL queries

  o Database testing and validation

Module 12: Performance Testing (40 hours)

- **Week 41-44**: Performance Testing Concepts

  o **Clock Hours**: 16 hours theory, 24 hours lab

  o Load testing, stress testing, and scalability testing

  o Tools for performance testing (e.g., JMeter, HP LoadRunner)

o Analyzing performance test results

o Performance tuning and optimization

Elective Modules (120 hours) – Select any 3 courses

Module 13: Mobile Testing (40 hours)

- **Week 45-49**: Mobile Testing Fundamentals

  o **Clock Hours**: 16 hours theory, 24 hours lab

  o Introduction to mobile testing

  o Tools for mobile testing (e.g., Android Studio, Katalon, Perfecto)

  o Writing and executing mobile test cases

  o Testing on real devices and emulators

Module 14: API Testing (40 hours)

- **Week 50-54**: API Testing Concepts

  o **Clock Hours**: 16 hours theory, 24 hours lab

  o Introduction to API testing

  o Tools for API testing (e.g., Postman, SoapUI, Karate)

  o Writing and executing API test cases

  o Validating API responses and performance

Module 15: Power BI (40 hours)

- **Week 55-58**: Power BI Fundamentals

  o **Clock Hours**: 16 hours theory, 24 hours lab

  o Introduction to Power BI

  o Data visualization principles

  o Creating and sharing reports

  o Integrating Power BI with other tools

Module 16: Agile Scrum Certification (40 hours)

- **Week 59-63**: Scrum Master Certification Preparation

  o **Clock Hours**: 16 hours theory, 24 hours lab

o   Role and responsibilities of a Scrum Master

o   Facilitating Scrum ceremonies

o   Coaching Agile teams

o   Preparing for Scrum Master certification exams

Module 16: Project Management (40 hours)

- **Week 64-67:** Project Management Fundamentals

    o   **Clock Hours:** 24 hours theory, 16 hours lab

    o   Introduction to project management

    o   Project planning and scheduling

    o   Risk management

    o   Resource allocation

    o   Monitoring and controlling projects

    o   Project management tools (e.g., MS Project, Trello)

Module 17: AWS Cloud Solution Architect (40 hours)

- **Week 68-72:** AWS Cloud Solution Architect

    o   **Clock Hours:** 20 hours theory, 20 hours lab

    o   Understanding the fundamentals of cloud computing and the AWS ecosystem

    o   Overview of AWS services and their applications.

    o   Principles of designing resilient, high-performing, secure, and cost-optimized architectures.

    o   In-depth exploration of key AWS services such as EC2, S3, RDS, Lambda, and VPC.

    o   Strategies for cost optimization and management on AWS.

    o   Learn to design secure, scalable, and cost-effective cloud architectures.

    o   Develop the ability to design and implement AWS solutions.

Module 18: Capstone Project (40 hours)

- **Week 73-76:** Practical Application

    o   **Clock Hours:** 10 hours theory, 30 hours lab

o   Real-world project simulation

o   Applying learned concepts to a project

o   Collaboration and teamwork

o   Final presentation and evaluation

Additional Resources

- **Delivery Method**: Online via Zoom Meeting

- **Tools**: Selenium, JUnit, JMeter, Postman, SoapUI, SQL Server, Power BI, Azure DevOps, JIRA, ALM, LoadRunner, Karate framework, Zephyr, Katalon, Perfecto, Maven, GIT, Jenkins, Qmetry

- **GlobeTech Academy will** provide Learning materials related to the Program like educational Book, Class notes, Quizzes, Test Preparation Q&A etc. in a digital format

- **Professional Development & Communication**

- **Career Readiness & Job Placement**

This updated curriculum ensures a well-rounded education in software quality engineer(SQA), preparing students for various roles and certifications in the field.

Note:

Full-Time	Part-Time
* **Weeks Required:** 30 Weeks	* **Weeks Required:** 60 Weeks
* **Months Required:** 7.5 Months	* **Months Required:** 15 Months
* **Hours per Week:** 20 Hours	* **Hours per Week:** 10 Hours
Total Program Hours: 600 hours	**Total Program Hours: 600 hours**