Software Testing Curriculum

Month 1: Introduction to Software Testing

Week 1:

- Session 1: Introduction to Software Testing.
    - Definition, Importance, and Objectives of Software Testing.
    - Role of Testing in Software Development Life Cycle (SDLC).
- Session 2: Testing Fundamentals.
    - Testing Principles and Processes.
    - Hands-on: Test Environment Setup.

Week 2:

- Session 3: Testing Techniques
    - Black Box vs. White Box Testing
    - Static vs. Dynamic Testing
- Session 4: Test Case Development
    - Writing Effective Test Cases
    - Hands-on: Creating Test Cases

Week 3:

- Session 5: Test Management
    - Test Planning, Monitoring, and Control
    - Test Strategy and Test Plan Documents
- Session 6: Test Execution and Reporting
    - Running Tests, Recording Results, and Reporting Defects
    - Hands-on: Test Execution and Defect Reporting

Week 4:

- Session 7: Introduction to Automation Testing
    - Benefits and Challenges of Test Automation
    - Overview of Automation Tools
- Session 8: Hands-on Automation

- Setting up Automation Environment
- Simple Automation Scripting

Midterm Test:

- Covers material from Month 1
- Multiple-choice questions, practical testing exercises, and short answers
- Duration: 4 hours

Month 2: Advanced Testing Techniques

Week 5:

- Session 9: Functional and Non-Functional Testing
    - Functional, Performance, Security, and Usability Testing
    - Hands-on: Performance and Security Testing
- Session 10: Exploratory and Ad-hoc Testing
    - Techniques, Benefits, and Challenges
    - Hands-on: Conducting Exploratory Tests

Week 6:

- Session 11: Regression and Retesting
    - Strategies and Best Practices
    - Hands-on: Implementing Regression and Retesting
- Session 12: User Acceptance Testing (UAT)
    - UAT Process, Criteria, and Execution
    - Hands-on: Performing UAT

Week 7:

- Session 13: Mobile and Web Application Testing
    - Challenges and Testing Approaches
    - Hands-on: Testing Mobile and Web Apps
- Session 14: Test Documentation and Reporting
    - Importance of Documentation
    - Creating Effective Test Reports

Week 8:

- Session 15: Introduction to Agile Testing
  - Agile Principles and Testing in Agile Environment
  - Hands-on: Agile Testing Practices
- Session 16: Test Automation Frameworks
  - Types of Frameworks: Data-driven, Keyword-driven, and Hybrid
  - Hands-on: Developing Automation Framework

Month 3: Specialized Testing and Tools

Week 9:

- Session 17: Load and Stress Testing
  - Concepts, Tools, and Best Practices
  - Hands-on: Conducting Load Tests
- Session 18: Test Management Tools
  - Overview and Hands-on with Tools like JIRA, TestRail

Week 10:

- Session 19: Security and Penetration Testing
  - Principles, Tools, and Techniques
  - Hands-on: Performing Security Tests
- Session 20: Code Coverage and Static Analysis
  - Importance and Tools
  - Hands-on: Using Code Coverage Tools

Week 11:

- Session 21: API and Service Testing
  - Basics of API Testing and Tools
  - Hands-on: Testing APIs
- Session 22: Cloud-based Testing
  - Benefits, Challenges, and Tools
  - Hands-on: Conducting Tests on Cloud Platforms

Week 12:

- Session 23: Test Automation Best Practices
    - Effective Automation Strategies and Maintenance
    - Hands-on: Advanced Automation Techniques
- Session 24: Test Metrics and KPIs
    - Important Metrics for Measuring Testing Effectiveness
    - Hands-on: Analyzing Test Metrics

Month 4: Advanced Topics and Final Project

Week 13:

- Session 25: Continuous Integration/Continuous Testing (CI/CT)
    - CI/CT Principles, Tools, and Implementation
    - Hands-on: Setting up CI/CT Pipeline
- Session 26: Exploring Emerging Trends in Software Testing
    - AI in Testing, Shift-left Testing, and more

Week 14:

- Session 27-28: Final Project Work
    - Group Project: Comprehensive Testing of a Sample Application

Week 15:

- Session 29: Final Project Presentation and Review

Week 16:

- Session 30: Final Examination Review and Preparation

Final Examination:

- Covers material from Month 2-4
- Comprehensive assessment including theoretical concepts, practical testing exercises, hands-on automation, and final project presentation
- Duration: 4 hours