Mehran University of Engineering and Technology, Jamshoro
Department of Software Engineering

ORIGINAL SUBMITTED SYLLABUS

Title of Subject	**:**	**Software Quality Engineering (SW426)**
Discipline	**:**	Software Engineering (8th Semester)
Effective	**:**	F16 Batch & onwards
Pre-requisite	**:**	Formal Methods in Software Engineering, Software Re-engineering
Assessment	**:**	Theory**:** 20% Sessional, 80% Written Semester Examination (20% Mid, 60% Final) Practical: 40% Sessional, 60% Final Examination
Credit Hours	**:**	03 + 01 **Marks :** 100 + 50
Minimum Contact Hours:		45 + 45

Specific Objectives of course:

- To have an understanding of the basics and fundamentals of software quality assurance.
- To have hands-on practice on various testing techniques on different applications.

Course Learning Outcomes (CLOs):

Upon successful completion of the course, the student will be able to:

CLO	Description	Taxonomy Level	PLO
1	Explain basics of software quality assurance and testing fundamentals	C2	1
2	Analyze different scenarios to grasp working mechanism of various testing techniques	C4	2
3	Construct Test cases and perform testing on various applications using Modern Tools	P4	5

PROGRAM LEARNING OUTCOMES (PLOs):

The course is designed so that students will achieve the following PLOs:

1	Engineering Knowledge	☑	7	Environment and Sustainability	☐
2	Problem Analysis	☑	8	Ethics	☐
3	Design/Development of Solutions		9	Individual and Team Work	☐
4	Investigation	☐	10	Communication	☐
5	Modern Tool Usage	☑	11	Project Management	☐
6	The Engineer and Society	☐	12	Lifelong Learning	☐

Course outline:

- **SOFTWARE QUALITY ASSURANCE**
  Quality, Quality Control, Quality Assurance, SQA, FTR, Statistical Quality Assurance, Software Reliability, SQA Plan, ISO Standards

- **SOFTWARE TESTING TECHNIQUES**
  Software Testing Fundamentals, Testing Objectives, Testing Principles, Testability, WHITE-BOX Testing, Control Structure Testing, BLACK- BOX Testing

- **SOFTWARE TESTING STRATEGIES & OBJECT-ORIENTED TESTING**
  A Software Testing Strategy, Criteria for Completion of Testing, Unit Testing, Integration Testing, Validation Testing, System Testing, Debugging Process Testing OO Analysis and OO Design Models, OO Testing Strategies, Testing Methods for the Classes, Inner

Class Test Case Design

- **CLIENT/SERVER SOFTWARE ENGINEERING, COMPUTER – AIDED SOFTWARE ENGINEERING**

  Structure of Client / Server Systems, Software Engineering for Client / Server Systems, Design of Client/ Server Systems, Testing Issues, Building Blocks for CASE, CASE Tools, Integrated CASE Environments

Practical Work to be carried out:

1. Validation and verification
2. Developing test cases
3. Application of Black box testing
4. Applying OO testing strategies
5. Unit testing using JUnit
6. Creating test suites using JUnit
7. Creating Mocks using in Mockito
8. Integration testing
9. Coding and testing cross reference
10. Web Functional Testing using Selenium
11. Application of formal methods
12. Producing log Using Log4J
13. Working with performance testing
14. Working with load testing
15. Case study

Recommended Books:

- Software Engineering, Practitioners Approach, Roger S. Pressman, Mc.Graw Hill Inc, Latest Edition.
- Foundation of Software Testing, Dorothy Graham, Cengage Learning EMEA Publishers, Latest Edition.

Approval:

Board of Studies:	**Resolution No. 02**	**Dated: 29-08-2019**
Board of Faculty:	**Resolution No.--**	**Dated:----------**
Academic Council:	**Resolution No.96.10**	**Dated: 07-10-2019**