



Course Specification

(Bachelor)

Course Title: **SOFTWARE TESTING AND QUALITY**

Course Code: **COMP 575**

Program: **Bachelor in Computer Science**

Department: **Computer Science**

College: **Computer Science and Information Technology**

Institution: **Jazan University**

Version: **V1**

Last Revision Date: **11/08/2024**



Table of Contents

A. General information about the course:	3
B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods	4
C. Course Content	5
D. Students Assessment Activities	6
E. Learning Resources and Facilities	7
F. Assessment of Course Quality	8
G. Specification Approval	8



A. General information about the course:

1. Course Identification

1. Credit hours: (03 Hours)

2. Course type

A. ☐ University ☐ College ☒ Department ☐ Track ☐ Others
B. ☐ Required ☒ Elective

3. Level/year at which this course is offered: (Level 08 /Year 4)

4. Course general Description:

The course covers the Concept of software quality, software metrics, & Total Quality Management. SQA planning & implementation. Validation & verification. Reviews, walkthroughs & inspections. Automatic and manual techniques for generating and validating test data. Static vs. dynamic analysis, functional testing, inspections, and reliability assessment. Students participate in a group project on software validation and verification.

5. Pre-requirements for this course (if any):

Software requirement Engineering COMP 473

6. Pre-requirements for this course (if any):

7. Course Main Objective(s):

- The primary objective of this course is to equip students with a thorough understanding of software testing and quality assurance practices. The course aims to develop students' abilities to design, implement, and manage testing processes, ensuring that software systems meet high standards of quality, reliability, and security. Through the exploration of various testing techniques, tools, and methodologies, as well as the principles of software quality assurance, students will be prepared to effectively evaluate and improve the quality of software products in real-world scenarios, while also understanding the ethical and professional responsibilities inherent in the field.





2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%
2	E-learning		
3	Hybrid <ul style="list-style-type: none"> Traditional classroom E-learning 		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	28
2.	Laboratory/Studio	28
3.	Field	
4.	Tutorial	
5.	Others (specify)	4
Total		60

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	outline software testing and software quality assurance principles.	K1	Lectures/Presentations Media Lectures	Midterm Exam Assignment- 1 & 2 Final Theory Exam
1.2	Identify appropriate test management and test automation techniques	K1	Lectures/Presentations Media Lectures	Midterm Exam Assignment- 1 & 2 Final Theory Exam



Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.0	Skills			
2.1	Apply various testing techniques, including Black Box, White Box, and Experience-Based testing, to effectively design, implement, and execute test cases.	S2	Lectures/Presentations Media Lectures	Assignment- 1 & 2 Final Theory Exam
2.2	Analyze and apply the stages of the Software Testing Life Cycle (STLC) to perform Unit Testing, Integration Testing, System Testing, and Acceptance Testing.	S1	Lectures/Presentations Media Lectures	Assignment- 1 & 2 Final Theory Exam
2.3	Develop and manage a comprehensive test plan, execute the testing process, and effectively document and report testing results.	S3	Lectures/Presentations Media Lectures	Assignment- 2 Lab Exam Final Theory Exam
2.4	Apply quality assurance techniques for problem solving.	S4	Lectures/Presentations Media Lectures	Assignment- 2 Lab Exam Final Theory Exam
3.0	Values, autonomy, and responsibility			
3.1	Work effectively in a team setting to plan, execute, and manage testing activities, and communicate findings clearly to both technical and non-technical stakeholders.	V3	Discussion/Braintstorming/ Media Lectures	Assignment-2 (Group Assignment)
3.2	Demonstrate an understanding of the ethical and professional responsibilities in software testing and quality assurance, including the importance of delivering reliable and secure software.			

C. Course Content

No	List of Topics	Contact Hours
1.	Chapter 1: Basics of OF SOFTWARE TESTING	4T+4P



	Overview of testing- Need for software testing – Testing principles – STLC models Testing in STLC models: Unit Testing, Integration Testing, System Testing, Acceptance Testing. Testing of software attributes: Smoke test, functional testing, usability testing, security, compliance testing.	
2.	Chapter 2: TESTING METHODOLOGIES Test Design techniques: Black Box testing- White Box testing – Experience- Based testing. Test Management Process: Formation of testing team- roles and responsibilities Test planning and control –Test analysis and design- Test implementation and execution – Test evaluation and reporting- Test closure activities.	4T+4P
3.	Chapter 3: TOOLS FOR TESTING Test tool classification- Tools for management and control- Tools for specification- Tools for static and dynamic testing- Tools for non-functional tests. Manual testing versus automated testing- automated testing tools.	6T+6P
4.	Chapter 4: Test Management Test Planning: prepare a test plan, deciding test approach, setting up criteria for Testing, Identify the resource requirement for given application, prepare test summary report.	6T+6P
5.	Chapter 5: OVERVIEW OF QUALITY ASSURANCE Definition of software quality and quality assurance- Quality assurance versus Quality control- Quality factors- Quality components – Quality plans- Software quality metrics Costs of software quality- Quality Management Framework- Commercial and government Standards in SQA - Pareto principal in SQA.	2T+2P
6	Chapter 6: QUALITY MANAGEMENT Requirements for SQA- Software QA versus Traditional QA- Defect prevention and process improvement- Software inspection- Software audit methods- Comparison of Quality Assurance techniques and activities- Quality improvement methods- Management and its role in SQA - Quality management in IT.	4T+4P
Total		28T+28P

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm Exam	9 TH week	15%
2.	Assignment I	5 th week	10%





No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
3.	Assignment II (Group assignment)	12 th week	15%
4.	Lab Exam-Case Study	15 th week	20%
5.	Final Theory Exam	16 th week	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	<ul style="list-style-type: none"> Andreas Spillner, Tilo Linz , Hans Schaefer “Software Testing Foundations - A Study Guide for the Certified Tester Exam” , Foundation Level ISTQB compliant, 4th Edition, Santa Barbara, CA :Rocky Nook, Inc, 2014.
Supportive References	<ul style="list-style-type: none"> Anne MetteJonassen Hass, “Guide to Advanced Software Testing”, Artech House Publishers, 2008. G. Gordon Schulmeyer, “Handbook of Software Quality Assurance”, Fourth Edition, Artech House Publishers, 2007. Rex Black, Erik Van Veenendaal, Dorothy Graham, “Foundations of Software Testing ISTQB Certification”, Third Edition, Cengage Learning, 2012.
Electronic Materials	https://www.tutorialspoint.com/software_engineering/software_requirements.htm https://www.youtube.com/watch?v=qENBiYaAXNE&list=PLUgFMzuE8lQDeixpbP3s6EyQx8PiNdeQL
Other Learning Materials	Online tutorial

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom equipped with projector, whiteboard, and sufficient seating arrangements. Lab with software installed and individual computer terminal for each student.
Technology equipment (projector, smart board, software)	Whiteboards and projectors for classroom and labs computer Lab equipped with 30 PCs having Rational Rose, ArgoUml, MS-VISIO An active internet connection.





Items	Resources
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect (Course evaluation survey form)
Effectiveness of Students assessment	CRC / QAU / HoD	Direct (Course reports / result analysis)
Quality of learning resources	Track leaders / CRC	Indirect (Review, meetings and star rating with suggestions for further modification and improvements)
The extent to which CLOs have been achieved	CRC / QAU	Direct (CLO assessment template further verified at course coordinator, Track leader and QAU level)
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	DEPARTMENT COUNCIL
REFERENCE NO.	
DATE	

