

GAU, Faculty of Engineering

Course Unit Title	Software Quality Assurance & Testing	
Course Unit Code	SEN324	
Type of Course Unit	Compulsory for SE	
Level of Course Unit	3rd year BSc	
National Credits	3	
Number of ECTS Credits Allocated	5	
Theoretical (hour/week)	3	
Practice (hour/week)	0	
Laboratory (hour/week)	0	
Year of Study	3	
Semester when the course unit is delivered	6	
Mode of Delivery	Face to face, E-learning	
Language of Instruction	English	
Prerequisites	SEN201	
Corequisites		
Recommended Optional Programme Components		
Objectives of the Course:		
<ul style="list-style-type: none"> • Introduce fundamental concepts of software quality assurance and verification & validation processes • Develop student ability to design and apply software testing techniques • Provide practical experience with test planning, defect tracking, and quality metrics • Encourage students to relate software quality practices with real-world development processes 		
Learning Outcomes		
When this course has been completed the student should be able to		Assess.
1	Learn how to explain software quality assurance concepts and V&V processes	1,3
2	Learn to design test cases using black-box and white-box techniques	1,3
3	Learn how to prepare test plans, test reports, and defect documentation	1,3
4	Learn how to apply reviews, static analysis, and testing tools	1,3
5	Understand quality metrics, quality models, and process improvement concepts	1,3
6	Learn how to perform a testing project and evaluate software quality	1,3
Assessment Methods: 1. Written Exam, 2. Assignment, 3. Project/Report, 4. Presentation, 5. Lab Work		
Course's Contribution to Program		
		CL
1	Ability to understand and apply knowledge of mathematics, science, and engineering	2
2	Ability to design and conduct experiments as well as to analyze and interpret	3
3	Ability to work in multidisciplinary teams while exhibiting professional responsibility and ethical conduct	3
4	Ability to apply systems thinking in problem solving	3
5	Knowledge of contemporary issues while continuing to engage in lifelong learning	2
6	Ability to use the techniques, skills and modern engineering tools necessary for engineering practice	3
7	Ability to express their ideas and findings, in written and oral form	3
8	Ability to design and integrate systems, components or processes to meet desired needs within realistic constraints	2

9	Ability to approach engineering problems and effects of their possible solutions within a well structured, ethically responsible and professional manner		3
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)			
Course Contents			
Week	Chapter	Subject	Exams
1	1	Introduction to Software Quality and Testing	
2	2	Verification, Validation, and Test Process	
3	3	Test Levels and Test Types	
4	4	Black-box Test Design Techniques	
5	5	White-box Testing and Coverage	
6	6	Reviews, Inspections, and Static Analysis	
7	7	Defect Tracking and Test Documentation	
8			Midterm
9	8	Unit, Integration, and System Testing	
10	9	Acceptance and Regression Testing	
11	10	Non-functional Testing and Performance Testing	
12	11	Test Automation and Tools	
13	12	Quality Metrics and Process Improvement	
14	13	Testing Project and Presentations	
15			Final
Recommended Sources			
<ul style="list-style-type: none"> Textbook: Foundations of Software Testing, 3rd Edition, Dorothy Graham, Erik van Veenendaal, and Isabel Evans Supplementary: Software Testing and Quality Assurance: Theory and Practice, 2nd Edition, Kshirasagar Naik and Priyadarshi Tripathy Supplementary: Introduction to Software Testing, 2nd Edition, Paul Ammann and Jeff Offutt 			
Assessment			
Midterm	25 %		
Final exam	35 %		
Project/lab	30 %		
Quizzes	10 %		
ECTS Allocated Based on the Student Workload			
Activities	Number	Duration (hour)	Total Workload (hour)
In-class lecture (including exam weeks)	15	3	45
Midterm exam	1	1.5	1.5
Midterm exam preparation	1	15	15
Final exam	1	1.5	1.5
Final exam preparation	1	20	20
Quiz	2	2	4
Assignment	4	3	12
Project/presentation/report writing	1	18	18
Lab and tutorial	4	2	8
Self-study	15	2	30
Total Workload			155.00
Total Workload / 30 (h)			5.17

ECTS Credit of the Course

5
