

SULTAN QABOOS UNIVERSITY COLLEGE OF SCIENCE DEPARTMENT OF COMPUTER SCIENCE BACHELOR OF SCIENCE IN COMPUTER SCIENCE COURSE OUTLINE

I. COURSE INFORMATION					
COURSE CODE	COMP5402				
COURSE TITLE	REQUIREMENTS ENGINEERING				
OMAN QUALIFICATION FRAMEWORK (OQF) LEVEL	8				
CREDIT HOURS	3				
CONTACT HOURS	4				
PRE-REQUISITES	COMP3401				
CO-REQUISITES					
EQUIVALENT COURSES					
INCOMPATIBLE COURSES					
	□ University Requirement		□ University	Elective	
COURSE CATEGORY	College Requirement		\Box College El	lective	
	Department Requirement		Departmer	nt Elective	
	□ Major Requirement		□ Major Elective		
	Specialization Requirement		🗆 Specializa	tion Elective	
	□ Other (specify):				
	College: Science		Department:	Computer Science	
COURSE OWNER	Center:		Unit:		
DELIVERY MODE	\boxtimes Face to Face	□ Blen	ded	□ Online	
			□ Lecture/La	b	
	□ Lecture/Seminar		□ Lecture/Stu	ıdio	
	⊠ Lecture/Tutorial		□ Lecture/Lab/Tutorial or Seminar		
Counce Type			□ Laboratory (Practical)		
COURSE I YPE	□ Field or Work Placement		□ Studio		
			□ Internship		
	□ Workshop		Project		
	□ Thesis		□ Other (specify):		
LANGUAGE OF INSTRUCTION	English	1			
	The course focuses on the theory and	practice	of requirement e	ngineering. It presents a	
COURSE DESCRIPTION	set of models, processes, techniques,	, best pra	actices, and tool	s to define and validate	
COURSE DESCRIPTION	functional and non-functional requirements of large-scale software systems. It focuses				
	on both object-oriented and goal-oriented requirement engineering.				

	\Box Augmente	ed Reality		□ Flipped Classroom		
	⊠ Blended I	Learning		□ Problem-Based Learning		ng
I EACHING AND LEARNING Stratecies	□ Discovery	-Based Learning		□ Project-Based Learning		5
DIRAILOIL	□ Student-L	ed Learning		□ Team-Base	ed Learning	
	□ Work-Bas	sed Learning		\Box Other (specify):		
A GERGMENTE COMPONENTE	□In-term ex	amination(s) 30% (2	2*15%)	□ Quizzes (%)	□Other
ASSESSMENT COMPONENT	□ Homework assignments (5%)			\Box Project (259)	%)	(specify):
	🗆 Final exa	mination (40%)		Practical/ I	Lab	(%)
	1. Requirem	ents Engineering: H	Fundame	ntals, Principle	s, and Tech	iniques, by
	Klaus Poh	ıl				
TEXTBOOKS AND	References:	tala of Deguineran	En sin :	aning her Vlana	Dahl and C	huia Duunu
EDUCATIONAL MATERIAL	1. Fundamer 2. KAOS tut	orial	ts Engine	ering, by Klaus	Poni and C	nris Rupp
	- Instructor Handouts					
GRADING METHOD	\square A-F Scale \square Pass/Not Pass \square Other (specific			specify):		
GRADING METHOD DESCRIPT	ON					
	Range	Letter Grade		Desc	ription	
	90 – 100	А	Exce	Exceptional performance: All course		
	86 - 89.9	A-	objec	objectives achieved and met in a		
			consi	consistently outstanding manner.		
	81-85.9	B+	Very	Good Perform	nance: The	majority of
	77 – 80.9	В	the c	ourse objectives	s achieved (i	najority
	73 – 76.9	В-	consi	stently thorough	h manner	t III a
A-F GRADING SCALE:	68 – 72.9	C+	Satis	factory Perfor	mance: At 1	east most
	64 - 67.9	С	of co	urse objectives	have been a	chieved
	60 - 63.9	C-	and r	net satisfactorily	у.	
	55 – 59.9	D+	Mini	mally Accepta	ble Perform	ance: The
	50 – 54.9	D	cours	se objectives me	et at a minim	ally
			accep	otable level.		
	0 – 49.9	F	Unac	cceptable perfo	rmance: Th	e course
			objec	table level	a minimali	ý
PASS/NOT PASS.			acce			
OTHER:						
	I					

II. SEMESTER INFORMATION			
SEMESTER/YEAR	Spring 25	SECTION(S)	1
DAY AND TIME	SUN/TUE 12:00-13:50	VENUE(S)	Lab 27
COURSE COORDINATOR	Youcef Baghdadi	COURSE TEAM	

COORDINATOR OFFICE	0023	OFFICE HOURS	WED 12:00-13:00
COORDINATOR EXTENSION	1492	COORDINATOR EMAIL	ybaghdadi@squ.edu.om

III. ALIGNMENT OF COURSE LEARNING OUTCOMES (CLO), PROGRAM LEARNING OUTCOMES (PLO), GRADUATE ATTRIBUTES (GA), AND OMAN QUALIFICATION FRAMEWORK (OQF) CHARACTERISTICS

	CLO	PLO / SO	SQU Graduate Attributes	OQF Characteristics
1.	Understand the concepts of need, requirement, problem and	SO6	А	1
	solution.			
2.	Recognize the necessity of requirement engineering.	SO6	А	1,2
3.	Apply the software requirement engineering processes to	SO6	D	2
	build quality, managed requirement for software systems			
4.	Verify, validate, and manage the requirements.	SO6	D	2
5.	Use tools to assist the requirements engineering process activities.	SO6	D	2
6.	Communicate orally and in writing a software system	SO3	С	3,4
	requirement process activities, deliverables, and milestones.			

IV. COURSE LEARNING OUTCOMES (CLOS) AND ASSESSMENT CRITERIA AND METHODS (FOR EACH CLO) CLO1: Understand the concepts of need, requirement, problem and solution.

ASSESSM	ENT CRITERIA (TO ACHIEVE THIS OBJECTIVE, THE STUDENT MUST)	ASSESSMENT METHODS		
• `				
A)	Be able to understand the concepts of the requirements	Midterm, Final		
B)	Be able to understand the concepts of problem/solution	Midterm, Final		
CLO2: Re	cognize the necessity of requirement engineering.			
ASSESSM	ENT CRITERIA (TO ACHIEVE THIS OBJECTIVE, THE STUDENT MUST)	ASSESSMENT METHODS		
A)	Be able to recognize the necessity of software requirements	Project		
CLO3: Aj	pply the software requirement engineering processes to build quality, managed r	equirement for software systems		
ASSESSM	ENT CRITERIA (TO ACHIEVE THIS OBJECTIVE, THE STUDENT MUST)	ASSESSMENT METHODS		
A)	Apply the software requirements processes	Midterm, Final, Project		
B)	Use tools to elicit, document, and validate the requirements	Project		
CLO4: Verify, validate, and manage the software requirements				
ASSESSM	ENT CRITERIA (TO ACHIEVE THIS OBJECTIVE, THE STUDENT MUST)	ASSESSMENT METHODS		
A)	Be able to verify the requirements	Midterm, Final, Project		
B)	Be able to validate the requirements	Midterm, Final, Project		
	Be able to manage the requirements			
CLO5: Us	e tools to assist the requirements engineering process activities			
ASSESSM	ENT CRITERIA (TO ACHIEVE THIS OBJECTIVE, THE STUDENT MUST)	ASSESSMENT METHODS		
A)	Apply verification techniques	Final, Project		
B)	Apply validation techniques	Final, Project		
CLO6: Co	ommunicate orally and in writing a software system requirement process activitie	es, delivrables, and milestones		
ASSESSM	ENT CRITERIA (TO ACHIEVE THIS OBJECTIVE, THE STUDENT MUST)	ASSESSMENT METHODS		
A)	Be able to document the requirements within a standard template	Project		

B)	Be able to present the documented requirements	Project
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V. COURSE CONTENT AND SCHEDULE					
WEEK	LECTURES #	TOPICS/ SUBJECTS	READINGS /	REMARKS (e.g.,	
			CHAPTERS	ASSESSMENTS)	
1	L1	 Introduction Definitions: Stakeholders, Needs, Goal, Requirements Problem/Solution: Abstraction Levels: Goals → User Requirements → System Requirements Types: Functional, Non-Functional, Constraints, Metrics Requirement Properties and Attributes Impacts: Social, Legal, and Economic Impacts on the activities of the SDLC: Architecture, Design, Implementation, Testing, and Maintenenes 	Chapters 1 & 2	Test 1 & Final Exam	
2	L2	RE Process - Generic Process: Role, Activities, Artifacts, Milestones, Tools - Activities: Feasibility, Elicitation, Specification and Documentation, Validation, and Management - Artifacts: Requirement Document, Requirement Properties and Attributes - Milestones - Tools	Handout	Test 1 & Final	
3	L3	 Pohl's Framework Core activities: Elicitation, Negotiation, Documentation Cross activities: Validation, Management 		Test 1 & Final	
4	L4	Requirements Elicitation - Stakeholders Elicitation Techniques and tools: Data Mining, Brainstorming, Ethnography, Protocol Analysis, Survey, Interview, Observation, Prototype	Chapter 2	Test 1 & Final	
5	L5	Goal Modeling - GORE: Goal-Oriented Requirement Engineering	Chapter 4 Handout	Test 1 & Final	

6	L6	Goal Modeling - Goal Graph - KAOS	Chapter 4 Handout	Test 1 & Final
7	L7	- I* Goal Modeling - KAOS I*	Chapter 4 Handout	Test 2 & Final
8	L8	Scenario Documentation		Test 2 & Final
9	L9	Requirement Documentation		
10	L10	RequirementsSpecificationandDocumentationNatural LanguageModeling techniques (UML)-MathematicalSpecification: Method BGoal Modeling Techniques: KAOS, GORE , I*	Chapter 2	Test 2 & Final
11	L11	Requirement Negotiation		
12	L12	 <i>Requirements Validation</i> Verification and Validation Verifiability, Validity, Completeness, Correctness, Consistency, Realism Validation Techniques and tools: Review, Prototyping, Test-Case Generation 	Hangout Chapter 7	Test 2 & Final Exams
13	L13	 <i>Requirements Management</i> Traceability Versioning Update Tools 	Handout	Final Exams & Project
L14	L14	 Advances in Requirements Engineering AI and Requirements Engineering Process Aspect Oriented Programming and Non-Functional Requirements 	Chapter 4	Final Exams
15	L15	- Project Presentation		Project

VI. ADDITIONAL INFORMATION (e.g., RUBRICS, etc.)

Assessment Plan:			
Item	Date out	Due date	Weight
Project P1	Week 2	Week 5	2%
Project P2	Week 5	Week 7	5%
Test 1		Week 7	
Project P3	Week 7	Week 10	5%

Project P4	Week 11	Week 14	8%
Test 2	Week 14		15%
Project Presentation	Week 15		5%
Final Exam TBA			40%

Department's Late Submission Policy:

(a) 1-24 hours: 25% of the mark will be deducted.

(b) > 24 hours: Not accepted.

Department's Policy for Dealing with Cheating:

It is essential that each student solves all programming assignments, lab tests and exams individually unless instructed otherwise, e.g., for group projects. Copying, plagiarism, collusion, switching, and falsification are violations of the university academic regulations. Students involved in such acts will be severely penalized. The department has adopted a firm policy on this issue. A zero mark will be assigned the first time a student is caught involved in copying and his/her name will be added to a watch list maintained by the Head of Department. Further repeated involvements in copying will cause the student to get an F grade in that course. This is in line with the university academic regulations.

VII. STUDENTS RESPONSIBILITIES

It is the student's responsibility to know and comply with all University Academic Regulations relevant to participation in this course. These regulations specifically include attendance requirements and student academic code of conduct.

ACADEMIC	The University expects the students to approach their academic endeavors with
INTEGRITY	the highest academic integrity. Please refer to the Undergraduate Academic
	Regulations.
ADD AND DROP	Students who wish to drop or add the course should review the Undergraduate
	Academic Regulations.
ATTENDANCE	Sultan Qaboos University has a clear requirement for students to attend courses,
	detailed in the Undergraduate Academic Regulations.
ASSESSMENT AND	To ensure the provision of a sound and fair assessment and grading, please review
GRADING	the Undergraduate Academic Regulations.
GRADE APPEAL	Students who wish to appeal their grades should review the Undergraduate
	Academic Regulations.
CLASSROOM	Students are expected to dress professionally during class time as required by the
POLICIES	University. Use of phones or any other electronic devices in the classroom during
	class time is strictly prohibited. Unauthorized use may lead to faculty member
	confiscation of the device for the remainder of the class. Behavior that
	persistently or grossly interferes with classroom activities is considered
	disruptive behavior and may be subject to disciplinary action. A student
	responsible for disruptive behavior may be required to leave the class.

LATE AND MAKE-UP	Students are required to meet the course objectives by submitting coursework no		
WORK	later than the assigned due date. Students may be allowed to submit late work if		
	approved by the course coordinator. Assignments submitted after the due date		
	may be penalized.		
MISSED	All quizzes, tests, clinical evaluations, and exams must be completed by the date		
EVALUATIONS	they are assigned. If a quiz, test, or exam is missed due to a documented		
	emergency situation (e.g., medical emergency, death in the immediate family), it		
	is the student's responsibility to contact the instructor.		

Course Outline Appendix

A. PROGRAM LEARNING OUTCOMES / STUDENT OUTCOMES

SO1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.

SO2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.

SO3. Communicate effectively in a variety of professional contexts.

SO4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.

SO5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.

SO6. Apply computer science theory and software development fundamentals to produce computing-based solutions.

B. SQU Graduate Attributes

GRADUATE ATTRIBUTES	GRADUATE COMPETENCIES FOR UNDERGRADUATE		
	STUDIES		
A. Cognitive Capabilities: The graduate has	1. Demonstrates familiarity and works with advanced		
sufficient general and specialized theoretical	specialized knowledge in the area of specialization.		
knowledge that enables him/her to deal well	2. Demonstrates a general understanding of the		
with his/her specialty and other related fields.	relationship of advanced specialized knowledge		
	with knowledge in other relevant professional fields		
	and aspects.		

	3.	Demonstrates a comprehensive understanding of
		the theories, principles, and methods used in his/her
		specialty, and how to create and apply new
		knowledge.
	4.	Demonstrates general knowledge of the legal
		environment and necessary relevant regulatory
		frameworks.
	5.	Shows awareness of contemporary literature and
		research.
B. Skill and Professional Capability: The	1.	Applies concepts, theories, and investigative
graduate has sufficient skill and practical		methods to synthesize and interpret information to
experience that enables him/her to perform		evaluate conclusions.
all tasks related to the specialization and		Applies appropriate research methods and
other related fields.		techniques and employs digital knowledge
	3.	Evaluates and critiques information independently
	4.	Uses cognitive and technical skills to analyze
		complex issues and develop appropriate solutions.
	5.	Initiates new ideas or processes in the professional,
		educational or research context.
C. Effective Communication: The graduate	1.	Explains, presents, and adapts information to suit
has the ability to communicate effectively		the recipients.
with others to achieve the desired results	2.	Employs appropriate information and
		communication technology to collect and analyze
		information.
D. Autonomy and Leadership: The		Performs advanced professional activities
graduate has the ability to lead, make		independently.
decisions and take responsibility for		Demonstrates leadership skills.
decisions.		Takes professional responsibility.
	4.	Assumes full accountability for the tasks and their
		output.

E. Responsibility and Commitment: The	1.	Manages time and other resources assigned to
graduate appreciates the importance of		accomplishing tasks effectively and responsibly.
available resources and deals with them		Demonstrates effective practices when working in
effectively and is committed to the ethics of		teams.
the profession and society.		Demonstrates advanced levels of understanding of
		values and ethics relevant to the specialization,
		profession and local and international society and
		promotes them among others.
	4.	Works within the professional, institutional, and
		specialization guiding frameworks and strategic
		plans.
	5.	Interacts with community affairs positively and
		preserves national identity.
F. Development and Innovation: The	1.	Demonstrates the ability to independently manage
graduate has a passion for development and		learning tasks, with an awareness of how to develop
innovation in the field of specialization.		and apply new knowledge.
	2.	Utilizes specialized knowledge and skills for
		entrepreneurship.
	3.	Utilizes creative and innovative skills in the field of
		specialization

C. OQF Characteristics

- 1. Knowledge
- 2. Skills
- 3. Communication, Numeracy, and Information and Communication Technology Skills.
- 4. Autonomy and Responsibility
- 5. Employability and Values
- 6. Learning to learn