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

I. COURSE INFORMATION			
COURSE CODE	COMP4515		
COURSE TITLE	**MOBILE NETWORKS**		
OMAN QUALIFICATION FRAMEWORK (OQF) LEVEL	**8**		
CREDIT HOURS	3		
CONTACT HOURS	4		
PRE-REQUISITES	COMP3502		
CO-REQUISITES			
EQUIVALENT COURSES			
INCOMPATIBLE COURSES			
COURSE CATEGORY	☐ University Requirement	☐ University Elective	
	☐College Requirement	☐ College Elective	
	☐ Department Requirement	☐ Department Elective	
	☐ Major Requirement	☐ Major Elective	
	☒ Specialization Requirement	☐ Specialization Elective	
	☐ Other (specify):		
COURSE OWNER	College: Science	Department: Computer Science	
	Center:	Unit:	
DELIVERY MODE	☒ Face to Face	☐ Blended	☐ Online
COURSE TYPE	☐ Lecture	☐ Lecture/Lab	
	☐ Lecture/Seminar	☐ Lecture/Studio	
	☒ Lecture/Tutorial	☐ Lecture/Lab/Tutorial or Seminar	
	☐Tutorial	☐ Laboratory (Practical)	
	☐ Field or Work Placement	☐ Studio	
	☐Seminar	☐ Internship	
	☐ Workshop	☐ Project	
	☐ Thesis	☐ Other (specify):	
LANGUAGE OF INSTRUCTION	English		
COURSE DESCRIPTION	The course introduces wireless and mobile networks. Topics include wireless communication fundamentals, medium access control protocols and standards,		

	cellular networks, wireless Internet, 4G system, pervasive networking, Ad-Hoc networks, and sensor networks.		
TEACHING AND LEARNING STRATEGIES	☐ Augmented Reality	☐ Flipped Classroom	
	☐ Blended Learning	☐ Problem-Based Learning	
	☒ Discovery-Based Learning	☐ Project-Based Learning	
	☐ Student-Led Learning	☐ Team-Based Learning	
	☒ Work-Based Learning	☐ Other (specify):	
ASSESSMENT COMPONENT AND WEIGHT	☒In-term examination(s) (30%)	☐ Quizzes (%)	☐Other (specify): (%)
	☐ Homework assignments (10%)	☒Project (20%)	
	☒ Final examination (40%)	☐ Practical/ Lab (%)	
TEXTBOOKS AND EDUCATIONAL MATERIAL	Lecture Slides and Handouts		
GRADING METHOD	☒ A-F Scale	☐ Pass/Not Pass	☐ Other (specify):

GRADING METHOD DESCRIPTION

	Range	Letter Grade	Description
A-F GRADING SCALE:	90 – 100	A	**Exceptional performance:** All course objectives achieved and met in a consistently outstanding manner.
	86 – 89.9	A-	
	81– 85.9	B+	**Very Good Performance:** The majority of the course objectives achieved (majority being at least two-thirds) and met in a consistently thorough manner.
	77 – 80.9	B	
	73 – 76.9	B-	
	68 – 72.9	C+	**Satisfactory Performance:** At least most of course objectives have been achieved and met satisfactorily.
	64 – 67.9	C	
	60 – 63.9	C-	
	55 – 59.9	D+	**Minimally Acceptable Performance:** The course objectives met at a minimally acceptable level.
	50 – 54.9	D	
	0 – 49.9	F	**Unacceptable performance:** The course objectives not met at a minimally acceptable level.
PASS/NOT PASS:			
OTHER:			

II. SEMESTER INFORMATION			
SEMESTER/YEAR	Fall/2024	**SECTION(S)**	2
DAY AND TIME	SUN/TUE Section 01/ 8:00-9:50 Section 02/ 14:15-16:05	**VENUE(S)**	Section 01/ F27 & A04 Section 02/ E12

COURSE COORDINATOR	Faiza Al-Salti	**COURSE TEAM**	-
COORDINATOR OFFICE	0012	**OFFICE HOURS**	SUN (10:00-11:00) & (WED 11:00-12:00)
COORDINATOR EXTENSION	1466	**COORDINATOR EMAIL**	f.alsalti1@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**	Error! Reference source not found.	Error! Reference source not found.
1. Demonstrate an understanding of the **fundamentals** of **mobile/wireless networks**.	SO1	A	1
2. Discuss the principles of **Wireless Local Area Networks (WLANs)** and their standards and protocols.	SO1, SO2	A, B	1,2
3. Identify the principles of **Mobile Ad Hoc Networks (MANETs)**.	SO1, SO2	A, B	1,2
4. Describe the basics of **Wireless Sensor Networks (WSNs)** and their impact on protocol design.	SO1, SO2	A, B	1,2
5. Examine the principles underlying **Cellular Networks** and their standards and protocols.	SO1, SO2	A, B	1,2
6. Collaborate efficiently in teams to design and implement a complete mobile network.	SO2, SO3, SO4, SO5, SO6	B, C, E, F	1,2,3, 6

IV. COURSE LEARNING OUTCOMES (CLOS) AND ASSESSMENT CRITERIA AND METHODS (FOR EACH CLO)		
CLO1: Demonstrate an understanding of the **fundamentals** of **mobile/wireless networks**.		
ASSESSMENT CRITERIA (TO ACHIEVE THIS OBJECTIVE, THE STUDENT MUST)		**ASSESSMENT METHODS**
A)	Understand and differentiate the elements of wireless networks.	Assignment 1 and/or Test 1 and/or Final
B)	Discuss wireless channels and their related concepts (frequency, bandwidth, characteristics and properties, and other factors).	
C)	Discuss the classification/types of wireless networks based on their size and range, and list the standards and technologies used in each.	
CLO2: Discuss the principles of **Wireless Local Area Networks (WLANs)** and their standards and protocols.		
ASSESSMENT CRITERIA (TO ACHIEVE THIS OBJECTIVE, THE STUDENT MUST)		**ASSESSMENT METHODS**
A)	Examine WLAN technology and standards.	Assignment 1 and/or Assignment 2 and/or

B)	Describe the components of a WLAN infrastructure.	Test 1 and/or Project and/or Final
C)	Explain how wireless technology enables WLAN operation.	
D)	Explain how a WLC uses CAPWAP to manage multiple access points.	
E)	Describe channel management in a WLAN.	
F)	Identify threats to WLANs.	
G)	Discuss WLAN security mechanisms.	
H)	Examine routing protocols in WLANs.	
CLO3: Identify the principles of **Mobile Ad Hoc Networks (MANETs)**.		
ASSESSMENT CRITERIA (TO ACHIEVE THIS OBJECTIVE, THE STUDENT MUST)		**ASSESSMENT METHODS**
A)	Understand what is a MANET and its possible applications.	Assignment 2 and/or Test 2 and/or Project and/or Final
B)	Identify the issues and goals of routing protocols in MANETs.	
C)	Discuss the classifications of routing protocols in MANETs.	
D)	Describe and analyze some of the routing protocols used in MANETs.	
CLO4: Describe the basics of **Wireless Sensor Networks (WSNs)** and their impact on protocol design.		
ASSESSMENT CRITERIA (TO ACHIEVE THIS OBJECTIVE, THE STUDENT MUST)		**ASSESSMENT METHODS**
A)	Identify the components of WSNs and their key features.	Test 2 and/or Project and/or Final
B)	Discuss the characteristics, design challenge, operational challenges and design considerations in WSNs.	
C)	Discuss some of the key principles of MAC protocols for WSNs.	
D)	Describe and analyze some of the MAC protocols used in WSNs.	
CLO5: Examine the principles underlying **Cellular Networks** and their standards and protocols.		
ASSESSMENT CRITERIA (TO ACHIEVE THIS OBJECTIVE, THE STUDENT MUST)		**ASSESSMENT METHODS**
A)	Identify some key principles of Cellular Networks.	Test 2 and/or Final
B)	Discuss the evolution of Cellular Network.	
C)	Describe and analyze the handover techniques used in Cellular networks.	
D)	Examine some of the key concepts and operations in 4G and 5G.	
CLO6: Collaborate efficiently in teams to design and implement a complete mobile network.		
ASSESSMENT CRITERIA (TO ACHIEVE THIS OBJECTIVE, THE		**ASSESSMENT METHODS**

STUDENT MUST)		
A)	Propose, document and present the specifications and design details of the selected mobile network.	Project
B)	Collaborate proficiently within a team to successfully implement the proposed mobile network.	

V. COURSE CONTENT AND SCHEDULE

WEEK	LECTURES #	TOPICS/ SUBJECTS	READINGS/ CHAPTERS	REMARKS (e.g., ASSESSMENTS)
1	1	Introduction to Wireless and Mobile Networks	Chapter 1	Assignment 1 and/or Test 1 and/or Final
2	2	Introduction to Wireless and Mobile Networks	Chapter 1	
3	2	WLANs	Chapter 2	Assignment 1 and/or Assignment 2 and/or Test 1 and/or Project and/or Final
4	2	WLANs	Chapter 2	
5	2	WLANs	Chapter 2	
6	2	MANETs	Chapter 3	Assignment 2 and/or Test 2 and/or Project and/or Final
7	1	MANETs	Chapter 3	
8	2	MANETs + WSNs	Chapter 3 + Chapter 4	
9	1	WSNs	Chapter 4	Assignment 2 and/or Test 2 and/or Project and/or Final
10	2	WSNs	Chapter 4	
11	2	Cellular Networks	Chapter 5	Test 2 and/or Final
12	2	Cellular Networks	Chapter 5	
13	1	Cellular Networks	Chapter 5	
14	2	Cellular Networks	Chapter 5	
15		Project Presentation		

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

ASSESSMENT PLAN:

TEST 1 (15%), TEST 2 (15%), PROJECT (20%), 2 ASSIGNMENTS (10%) AND FINAL EXAM (40%)

ASSESSMENT COMPONENT	POSTED DATE	DUE DATE	WEIGHT
ASSIGNMENT #1	**WEEK 4**	**WEEK 5**	**5%**
ASSIGNMENT #2	**WEEK 6**	**WEEK 7**	**5%**

TEST 1	**WEEK 8 _ 2ND CLASS (6:10-7:10)**		**15%**
PROJECT _ PART 1	**WEEK 9**	**WEEK 10**	**5%**
PROJECT _ PART 2	**WEEK 11**	**WEEK 14**	**10%**
TEST 2	**WEEK 13 _ 2ND CLASS (6:10-7:10)**		**15%**
PROJECT PRESENTATION	**WEEK 15**		**5%**
FINAL EXAM	**01/01/2025**		**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 INTEGRITY	The University expects the students to approach their academic endeavors with 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 GRADING	To ensure the provision of a sound and fair assessment and grading, please review the **Undergraduate Academic Regulations**.
GRADE APPEAL	Students who wish to appeal their grades should review the **Undergraduate Academic Regulations**.

CLASSROOM POLICIES	Students are expected to dress professionally during class time as required by the 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 WORK	Students are required to meet the course objectives by submitting coursework no 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 EVALUATIONS	All quizzes, tests, clinical evaluations, and exams must be completed by the date 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.
OTHER	

Course Outline Appendix

A. PROGRAM LEARNING 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 and Competencies for Undergraduate Studies

GRADUATE ATTRIBUTES	GRADUATE COMPETENCIES FOR UNDERGRADUATE STUDIES
A. Cognitive Capabilities: The graduate has sufficient general and specialized theoretical knowledge that enables him/her to deal well with his/her specialty and other related fields.	1. Demonstrates familiarity and works with advanced specialized knowledge in the area of specialization.
	2. Demonstrates a general understanding of the 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 graduate has sufficient skill and practical experience that enables him/her to perform all tasks related to the specialization and other related fields.	1. Applies concepts, theories, and investigative methods to synthesize and interpret information to evaluate conclusions.
	2. Applies appropriate research methods and 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 has the ability to communicate effectively with others to achieve the desired results.	1. Explains, presents, and adapts information to suit the recipients.
	2. Employs appropriate information and communication technology to collect and analyze information.

D. Autonomy and Leadership: The graduate has the ability to lead, make decisions and take responsibility for decisions.	1. Performs advanced professional activities independently. 2. Demonstrates leadership skills. 3. Takes professional responsibility. 4. Assumes full accountability for the tasks and their output.
E. Responsibility and Commitment: The graduate appreciates the importance of available resources and deals with them effectively and is committed to the ethics of the profession and society.	1. Manages time and other resources assigned to accomplishing tasks effectively and responsibly. 2. Demonstrates effective practices when working in teams. 3. 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 graduate has a passion for development and innovation in the field of specialization.	1. Demonstrates the ability to independently manage learning tasks, with an awareness of how to develop 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