



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

<b>I. COURSE INFORMATION</b>			
<b>COURSE CODE</b>	COMP5511		
<b>COURSE TITLE</b>	COMPUTER FORENSICS		
<b>OMAN QUALIFICATION FRAMEWORK (OQF) LEVEL</b>	8		
<b>CREDIT HOURS</b>	3		
<b>CONTACT HOURS</b>	4		
<b>PRE-REQUISITES</b>	COMP4509		
<b>CO-REQUISITES</b>			
<b>EQUIVALENT COURSES</b>			
<b>INCOMPATIBLE COURSES</b>			
<b>COURSE CATEGORY</b>	<input type="checkbox"/> University Requirement	<input type="checkbox"/> University Elective	
	<input type="checkbox"/> College Requirement	<input type="checkbox"/> College Elective	
	<input type="checkbox"/> Department Requirement	<input type="checkbox"/> Department Elective	
	<input type="checkbox"/> Major Requirement	<input type="checkbox"/> Major Elective	
	<input checked="" type="checkbox"/> Specialization Requirement	<input type="checkbox"/> Specialization Elective	
	<input type="checkbox"/> Other (specify):		
<b>COURSE OWNER</b>	College: Science	Department: Computer Science	
	Center:	Unit:	
<b>DELIVERY MODE</b>	<input checked="" type="checkbox"/> Face to Face	<input type="checkbox"/> Blended	<input type="checkbox"/> Online
<b>COURSE TYPE</b>	<input type="checkbox"/> Lecture	<input checked="" type="checkbox"/> Lecture/Lab	
	<input type="checkbox"/> Lecture/Seminar	<input type="checkbox"/> Lecture/Studio	
	<input type="checkbox"/> Lecture/Tutorial	<input type="checkbox"/> Lecture/Lab/Tutorial or Seminar	
	<input type="checkbox"/> Tutorial	<input type="checkbox"/> Laboratory (Practical)	
	<input type="checkbox"/> Field or Work Placement	<input type="checkbox"/> Studio	
	<input type="checkbox"/> Seminar	<input type="checkbox"/> Internship	
	<input type="checkbox"/> Workshop	<input type="checkbox"/> Project	
	<input type="checkbox"/> Thesis	<input type="checkbox"/> Other (specify):	
<b>LANGUAGE OF INSTRUCTION</b>	English		
<b>COURSE DESCRIPTION</b>	This course discusses the techniques and practices for gathering and analyzing evidences used to solve crimes involving computers. It includes topics related to Data Acquisition, Processing Crime and Incident Scenes, Current Computer		

	Forensics Tools, Windows, Macintosh and Linux Boot Processes and File Systems, Recovering Graphics Files, Email Investigations, Cell Phone and Mobile Device Forensics, Report Writing for High Tech Investigations.		
<b>TEACHING AND LEARNING STRATEGIES</b>	<input type="checkbox"/> Augmented Reality	<input type="checkbox"/> Flipped Classroom	
	<input type="checkbox"/> Blended Learning	<input checked="" type="checkbox"/> Problem-Based Learning	
	<input checked="" type="checkbox"/> Discovery-Based Learning	<input type="checkbox"/> Project-Based Learning	
	<input type="checkbox"/> Student-Led Learning	<input type="checkbox"/> Team-Based Learning	
	<input checked="" type="checkbox"/> Work-Based Learning	<input type="checkbox"/> Other (specify):	
<b>ASSESSMENT COMPONENT AND WEIGHT</b>	<input checked="" type="checkbox"/> In-term examination(s) (20%)	<input type="checkbox"/> Quizzes (%)	<input type="checkbox"/> Other (specify): ( %)
	<input checked="" type="checkbox"/> Homework assignments (20%)	<input type="checkbox"/> Project (%)	
	<input checked="" type="checkbox"/> Final examination (40%)	<input checked="" type="checkbox"/> Practical/ Lab (20%)	
<b>TEXTBOOKS AND EDUCATIONAL MATERIAL</b>	<p><b>Textbook (Soft copy)</b></p> <ul style="list-style-type: none"> <li>Guide to Computer Forensics and Investigations, by B. Nelson, A. Phillips, and C. Steuart, 2019</li> </ul> <p><b>Others</b></p> <ul style="list-style-type: none"> <li>Lecture Slides</li> <li>Lab Manual</li> </ul>		
<b>GRADING METHOD</b>	<input checked="" type="checkbox"/> A-F Scale	<input type="checkbox"/> Pass/Not Pass	<input type="checkbox"/> Other (specify):
<b>GRADING METHOD DESCRIPTION</b>			
<b>A-F GRADING SCALE:</b>	<b>Range</b>	<b>Letter Grade</b>	<b>Description</b>
	90 – 100	A	<b>Exceptional performance:</b> All course objectives achieved and met in a consistently outstanding manner.
	86 – 89.9	A-	
	81– 85.9	B+	<b>Very Good Performance:</b> 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+	<b>Satisfactory Performance:</b> At least most of course objectives have been achieved and met satisfactorily.
	64 – 67.9	C	
	60 – 63.9	C-	
	55 – 59.9	D+	<b>Minimally Acceptable Performance:</b> The course objectives met at a minimally acceptable level.
	50 – 54.9	D	
0 – 49.9	F	<b>Unacceptable performance:</b> The course objectives not met at a minimally acceptable level.	
<b>PASS/NOT PASS:</b>			
<b>OTHER:</b>			

II. SEMESTER INFORMATION			
SEMESTER/YEAR	Spring/2025	SECTION(S)	2
DAY AND TIME	SUN/TUE 8:00-9:50  MON/WED 12:00-1:50	VENUE(S)	SUN & TUE: Lab 27 MON: D15 WED: Lab 18
COURSE COORDINATOR	Faiza Al-Salti	COURSE TEAM	-
COORDINATOR OFFICE	0012	OFFICE HOURS	SUN & TUE (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. Understand the fundamentals of computer forensics and explain how the use of electronic evidence developed.	SO1	A	1
2. Demonstrate the ability to perform basic forensic data acquisition and analysis using forensic tools.	SO1, SO2	A, B	1,2
3. Understand the guidelines on processing crime and incident scenes.	SO1, SO2	A, B	1,2
4. Examine file systems, registry and secure the evidences.	SO1, SO2	A, B	1,2
5. Analyze the evidences that were gathered from sources such as wired and wireless networks.	SO1, SO2	A, B	1,2
6. Conduct email investigation using forensic tools.	SO1, SO2	A, B	1,2
7. Discuss mobile devices forensics.	SO1	A	1

IV. COURSE LEARNING OUTCOMES (CLOs) AND ASSESSMENT CRITERIA AND METHODS (FOR EACH CLO)		
<b>CLO1:</b> Understand the fundamentals of computer forensics and explain how the use of electronic evidence developed.		
ASSESSMENT CRITERIA (TO ACHIEVE THIS OBJECTIVE, THE STUDENT MUST)		ASSESSMENT METHODS
A)	Describe the field of digital forensics.	Midterm and/or Assignment 1 and Final
B)	Explain the importance of maintaining professional conduct.	
C)	Describe how to prepare a digital forensics investigation by taking a systematic approach.	
D)	Explain requirements for data recovery workstations and software.	

<b>CLO2: Demonstrate the ability to perform basic forensic data acquisition and analysis using forensic tools.</b>		
<b>ASSESSMENT CRITERIA (TO ACHIEVE THIS OBJECTIVE, THE STUDENT MUST)</b>		<b>ASSESSMENT METHODS</b>
A)	List digital evidence storage formats.	Midterm and/or Assignment 1 and/or Assignment 2 and Lab test and Final
B)	Explain ways to determine the best acquisition method.	
C)	Describe contingency planning for data acquisitions.	
D)	Explain how to use acquisition tools.	
E)	Explain how to validate data acquisitions.	
F)	Use forensic tools to conduct forensic data acquisition and analysis.	
<b>CLO3: Understand the guidelines on processing crime and incident scenes.</b>		
<b>ASSESSMENT CRITERIA (TO ACHIEVE THIS OBJECTIVE, THE STUDENT MUST)</b>		<b>ASSESSMENT METHODS</b>
A)	Explain the rules for controlling digital evidence	Assignment 1 and/or Assignment 2 and Midterm and/or Lab test and/or Final
B)	Describe how to collect evidence at private-sector incident scenes	
C)	Explain guidelines for processing law enforcement crime scenes	
D)	List the steps in preparing for an evidence search	
E)	Describe how to secure a computer incident or crime scene	
F)	Explain guidelines for seizing digital evidence at the scene	
G)	List procedures for storing digital evidence	
H)	Explain how to obtain a digital hash	
I)	Review a case to identify requirements and plan your investigation	
<b>CLO4: Examine file systems, registry and secure the evidences.</b>		
<b>ASSESSMENT CRITERIA (TO ACHIEVE THIS OBJECTIVE, THE STUDENT MUST)</b>		<b>ASSESSMENT METHODS</b>
A)	Collect volatile and nonvolatile information	Midterm and/or Assignment 2 and Lab test and Final
B)	Perform memory, registry, and file analysis	
<b>CLO5: Analyze the evidences that were gathered from sources such as wired and wireless networks.</b>		
<b>ASSESSMENT CRITERIA (TO ACHIEVE THIS OBJECTIVE, THE STUDENT MUST)</b>		<b>ASSESSMENT METHODS</b>
A)	Explain standard procedures for conducting forensic analysis of virtual machines	Assignment 3 and Lab test and Final
B)	Describe the process of a live acquisition	
C)	Explain network intrusions and unauthorized access	
D)	Describe standard procedures in network forensics and network-monitoring tools	
E)	Use some forensic tools to conduct network analysis	
<b>CLO6: Conduct email investigation using forensic tools.</b>		

A)	Explain the role of e-mail in investigations	Assignment 4 and Lab test and Final
B)	Describe client and server roles in e-mail	
C)	Describe tasks in investigating e-mail crimes and violations	
D)	Explain the use of e-mail server logs	
E)	Describe some specialized e-mail forensics tools	
F)	Use some forensic tools to conduct e-mail analysis	
CLO7: Explore mobile devices forensics.		
ASSESSMENT CRITERIA (TO ACHIEVE THIS OBJECTIVE, THE STUDENT MUST)		ASSESSMENT METHODS
A)	Explain the basic concepts of mobile device forensics	Final
B)	Describe procedures for acquiring data from mobile devices	
C)	Summarize the challenges of forensic acquisitions of data stored on Internet of Anything devices.	

<b>V. COURSE CONTENT AND SCHEDULE</b>				
<b>WEEK</b>	<b>LECTURES #</b>	<b>TOPICS/ SUBJECTS</b>	<b>READINGS/ CHAPTERS</b>	<b>REMARKS (e.g., ASSESSMENTS)</b>
<b>1</b>	1	Understanding The Digital Forensics Profession and Investigations	Chapter 1	Midterm and/or Assignment 1 and Final
<b>2</b>	2	Understanding The Digital Forensics Profession and Investigations	Chapter 1	
<b>3</b>	1	Data Acquisition Lab 1	Chapter 3 + Lab Manual	Midterm and/or Assignment 1 and/or Assignment 2 and Lab test and Final
<b>4</b>	2	Processing Crime and Incident Scenes	Chapter 4	Assignment 1 and/or Assignment 2 and Midterm and/or Lab test and/or Final
<b>5</b>	1	Windows Forensics Lab 2	Handout + Lab Manual	Midterm and/or Assignment 2 and Lab test and Final
<b>6</b>	2	Windows Forensics Digital Forensics Analysis and Investigation	Handout + Chapter 9	Midterm and/or Assignment 2 and Lab test and Final
<b>7</b>	1	Digital Forensics Analysis and Investigation Lab 3	Chapter 9 + Lab Manual	Midterm and/or Assignment 2 and/or Assignment 3 and Lab test and Final
<b>8</b>	1	Digital Forensics Analysis and	Chapter 10	Midterm and/or

		Investigation Lab 4	+ Lab Manual	Assignment 2 and/or Assignment 3 and Lab test and Final
<b>9</b>	1	Virtual Machine Forensics, Live Acquisitions, and Network Forensics  Midterm	Chapter 10 + Lab Manual	Assignment 3 and Lab test and Final
<b>10</b>	1	Virtual Machine Forensics, Live Acquisitions, and Network Forensics  Lab 5	Chapter 10 + Lab Manual	
<b>11</b>	1	E-mail Investigations  Lab 6	Chapter 11	Assignment 4 and Lab test and Final
<b>12</b>	1	E-mail Investigations  Lab 7	Chapter 11	
<b>13</b>	2	Mobile Device Forensics and the Internet of Anything	Chapter 12	Final
<b>14</b>	1	Mobile Device Forensics and the Internet of Anything  Lab Test	Chapter 12	
<b>15</b>		Either visiting the forensic lab in KOM 4 or inviting an external speaker		

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

##### ASSESSMENT PLAN:

**MIDTERM (20%), LAB TEST (20%), 4 ASSIGNMENTS (20%) 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%
MIDTERM	WEEK 8_ THURSDAY @12:00 PM		20%
ASSIGNMENT #3	WEEK 10	WEEK 11	5%
ASSIGNMENT #4	WEEK 12	WEEK 13	5%
LAB TEST	WEEK 14 _ THURSDAY @12:00 PM		20%

FINAL EXAM	28/05/2025 @ 8:00	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.

<b>ACADEMIC INTEGRITY</b>	The University expects the students to approach their academic endeavors with the highest academic integrity. Please refer to the <b>Undergraduate Academic Regulations</b> .
<b>ADD AND DROP</b>	Students who wish to drop or add the course should review the <b>Undergraduate Academic Regulations</b> .
<b>ATTENDANCE</b>	Sultan Qaboos University has a clear requirement for students to attend courses, detailed in the <b>Undergraduate Academic Regulations</b> .
<b>ASSESSMENT AND GRADING</b>	To ensure the provision of a sound and fair assessment and grading, please review the <b>Undergraduate Academic Regulations</b> .
<b>GRADE APPEAL</b>	Students who wish to appeal their grades should review the <b>Undergraduate Academic Regulations</b> .
<b>CLASSROOM POLICIES</b>	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.
<b>LATE AND MAKE-UP WORK</b>	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.
<b>MISSED EVALUATIONS</b>	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.
<b>OTHER</b>	

### 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	1. Demonstrates familiarity and works with advanced



graduate has sufficient general and specialized theoretical knowledge that enables him/her to deal well with his/her specialty and other related fields.	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>B. Skill and Professional Capability:</b> 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.
<b>C. Effective Communication:</b> 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.
<b>D. Autonomy and Leadership:</b> 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.

<p><b>E. Responsibility and Commitment:</b> The graduate appreciates the importance of available resources and deals with them effectively and is committed to the ethics of the profession and society.</p>	<ol style="list-style-type: none"> <li>1. Manages time and other resources assigned to accomplishing tasks effectively and responsibly.</li> <li>2. Demonstrates effective practices when working in teams.</li> <li>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.</li> <li>4. Works within the professional, institutional, and specialization guiding frameworks and strategic plans.</li> <li>5. Interacts with community affairs positively and preserves national identity.</li> </ol>
<p><b>F. Development and Innovation:</b> The graduate has a passion for development and innovation in the field of specialization.</p>	<ol style="list-style-type: none"> <li>1. Demonstrates the ability to independently manage learning tasks, with an awareness of how to develop and apply new knowledge.</li> <li>2. Utilizes specialized knowledge and skills for entrepreneurship.</li> <li>3. Utilizes creative and innovative skills in the field of specialization.</li> </ol>

**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