

SULTAN QABOOS UNIVERSITY

COLLEGE OF SCIENCE

DEPARTMENT OF COMPUTER SCIENCE

BACHELOR OF SCIENCE IN ARTIFICIAL INTELLIGENCE

COURSE OUTLINE

I. COURSE INFORMATION					
COURSE CODE	COMP2202	COMP2202			
COURSE TITLE	FUNDAMENTALS OF OBJECT (Orien	TED PROGRAM	MING	
OMAN QUALIFICATION	5				
FRAMEWORK (OQF) LEVEL	3				
CREDIT HOURS	3				
CONTACT HOURS	4				
PRE-REQUISITES	COMP2101				
CO-REQUISITES					
EQUIVALENT COURSES	COMP3200				
INCOMPATIBLE COURSES	COMP2206				
	□ University Requirement		□ University	Elective	
	□College Requirement		□ College El	ective	
COUDSE CATECODY	Department Requirement		□ Departmen	t Elective	
COURSE CATEGORI	□ Major Requirement		□ Major Elective		
	□ Specialization Requirement		□ Specializat	tion Elective	
	□ Other (specify):				
COUDSE OWNED	College: Science		Department:	Computer Science	
COURSE OWNER	Center:		Unit:		
DELIVERY MODE	\boxtimes Face to Face	\Box B	lended	□ Online	
			⊠ Lecture/Lat	b	
	□ Lecture/Seminar		□ Lecture/Studio		
	□ Lecture/Tutorial		□ Lecture/Lab/Tutorial or Seminar		
Coudse Tyde			□ Laboratory (Practical)		
COURSE ITTE	\Box Field or Work Placement				
	□Seminar		□ Internship		
	□ Workshop		Project		
	□ Thesis		□ Other (specify):		
LANGUAGE OF	Fnolish				
INSTRUCTION	LIGHON				

Course Description	This course introduces the concepts of object-oriented programming (OOP) and object-oriented-design (OOD). The course addresses the following topics: Abstract Data Types (ADTs), Classes, Objects, Inheritance, Polymorphism, Exceptions, and Memory Allocation. On Completion of this course students should be familiar with OOP principles and be able to implement them using an object oriented programming language.					
	□ Augmented	Reality		□ Flipped Classroom		
	□ Blended Le	arning		□ Problem-Bas	ed Learning	
I EACHING AND LEARNING	⊠ Discovery-l	Based Learning		□ Project-Base	d Learning	
SIRAIEGIES	□ Student-Leo	d Learning		□ Team-Based	Learning	
	⊠ Work-Base	d Learning		□ Other (specif	ý):	
	⊠ In-term exa	amination(s) (17	′%)	⊠Quizzes (3%)		
Assessment Component And Weight	I Homework	assignments (10)%)	□Project (%)	Leb exercises	
	⊠ Final exami	ination (40 %)		☑ Practical/Lab (20%)	(10%)	
TENTROOKSAND	 References: Java for Python Programmers, 2nd Edition, Brad Miller, 2011, <u>https://runestone.academy/runestone/books/published/java4python/Java4Pyhon/toctree.html</u> Java for Python Programmers, 3rd Edition, Brad Miller and James Riely, 2013, http://fpl.cs.depaul.edu/jriely/java4python/index.html 				011, (incodentions/JournalDut	
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	55 – 59.9	D+	Minimally Acceptable Performance:
	50 - 54.9	D	The course objectives met at a
			minimally acceptable level.
	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	Spring 2025	Section(s)	01-02-03	
DAY AND TIME	(see section VI)	VENUE(S)	SCI/0027	
COURSE COORDINATOR	Dr. Yassine Al-Jamoussi	COURSE TEAM	Drs Yassine, Ibrahim	
COORDINATOR OFFICE	DCS/0011	OFFICE HOURS	(see section VI)	
COORDINATOR EXTENSION	2464	COORDINATOR EMAIL	Yessine@squ.edu.om	

111.	ALIGNMENT OF COURSE LEARNING OUTCOMES (CLO), PROGRAM LEAF		COMES (PLO), O	RADUATE		
Ат	ATTRIBUTES (GA), AND OMAN QUALIFICATION FRAMEWORK (OQF) CHARACTERISTICS					
	CLO	PLO	SQU Graduate Attributes	OQF Characteristics		
1.	Understand fundamental object-oriented concepts	6	Α	1		
2.	Apply object-oriented concepts in programming tasks to solve basic problems	2, 6	Α	1, 2		
3.	Analyze real-world problems with an object-oriented perspective to identify key entities and relationships.	1	Α	1		
4.	Provide an object-oriented solution that meets a given set of requirements	2,6	Α	1,2		
5.	Implement and test an object-oriented solution using a specific object-oriented programming language.	2,6	Α	1, 2		

IV. COURSE LEARNING OUTCOMES (CLOS) AND ASSESSMENT CRITERIA AND METHODS (FOR EACH CLO)				
CLO1: Understand fundamental object-oriented concepts				
Assessme	Assessment Criteria (to achieve this objective, the student Assessment Methods			
MUST)				
A)	Correctly define and explain key object-oriented concepts			
B)	Identify and describe the use of classes, objects, inheritance, polymorphism, and encapsulation in	Quizzes, Midterm, and/or Final		

	given scenarios.	
CLO2: Ap	ply object-oriented concepts in programming tasks t	o solve basic problems
Assessme	NT CRITERIA (TO ACHIEVE THIS OBJECTIVE, THE STUDENT	Assessment Methods
мизт)		
A)	Develop simple programs that use classes and objects to model real-world entities.	
В)	Apply encapsulation to protect data and define clear interfaces in programming.	Lab Exercises, Assignments, Midterms and/or Final
C)	Implement inheritance, polymorphism and use of a collection of objects in programming.	
CLO3: Ar relations	halyze real-world problems using an object-oriented hips	perspective to identify key entities and
Assessme MUST)	NT CRITERIA (TO ACHIEVE THIS OBJECTIVE, THE STUDENT	Assessment Methods
A)	Break down real-world problems into key components and relationships using object-oriented analysis.	
В)	Provide written analysis identifying and explaining the main entities and their interaction by using standard representation, such as CRC.	Assignments, Midterm, and/or Final
CLO4: Pr	ovide an object-oriented solution that meets a given	set of requirements
Assessme MUST)	NT CRITERIA (TO ACHIEVE THIS OBJECTIVE, THE STUDENT	Assessment Methods
A)	Translate requirements into a comprehensive object-oriented design	Assignments, and/or Final
В)	Develop UML class diagrams to represent object- oriented solutions.	
CLO5: Im	plement and test an object-oriented solution using	a specific object-oriented programming
language		
Assessme	NT CRITERIA (TO ACHIEVE THIS OBJECTIVE, THE STUDENT	ASSESSMENT METHODS
MUST)		
A)	Write and debug code to implement the object- oriented solution	
В)	Use class libraries to ensure reusability	Assignments, midterm, Lab Test, and/or
C)	Employ generic classes to ensure type safety	Final
D)	Handle exception to ensure robustness	
E)	Develop and execute test cases to verify the correctness of the implemented solution	
F)	Demonstrate working programs that meet project	

V. COU	RSE CO	NTENT AND SCHEDULE		
WEEK	LEC TUR ES #	TOPICS/ SUBJECTS	READINGS/ CHAPTERS	Remarks (e.g., Assessments)
1	1	Object-Oriented Programming concepts and advantages Objects & classes, abstraction, encapsulation, inheritance, polymorphism, advantages, significant reasons why we use Java over python language	1	Midterm and/or Final
2-3	2	 Similarities and differences between Java and Python 1.3 - 1.6: The Java Programming Language, Becoming Familiar with Your Programming Environment, Analyzing Your First Program, Errors. 2.2, 3.1 - 3.3, 3.5: Variables, Numbers, Constants, Arithmetic, Input and Output, Strings. Ch. 4, Ch. 5: Control statements (Decisions, Loops) 	1, 2	Assignment #1 and/or Midterm and/or Lab Test and/or Final
4	1	Using Objects: 2.1, 2.3, 2.4: Objects and Classes, Working with objects (calling methods, creating, cloning and destroying objects), Object References, API Documentation	2	Assignment #1 and/or Midterm and/or Lab Test and/or Final
5	1	Input/Output Files: 10.1 - 10.5: Reading and Writing Text Files, Text Input and Output,	10	Assignment #1 and/or Midterm and/or Lab Test and/or Final
6	1	Implementing Classes: 2.5, 2.6 - 2.9: Instance Variables and Encapsulation, Specifying the Public Interface of a Class (constructors, methods), Providing the Class Implementation, Overloading constructors/methods, Unit Testing.	2	Assignment #2 and/or Midterm and/or Lab Test and/or Final
7-8	2	Introduction to Java collections: Arrays (Week 6) & Array Lists (Week 7) 6.1- 6.7: Arrays, Array Lists, The Enhanced for Loop, Common array algorithms, Problem solving, 2- Dimensional Arrays. Similarities & differences between Arrays and Array Lists.	6	Assignment #2 and/or Midterm and/or Lab Test and/or Final
9		Eid al-Fitr Holiday		
10	1	Designing Classes: 7.1, 7.2: Discovering Classes, Designing Good Methods 7.4: Problem Solving: Patterns for Object Data 7.5, 7.6: Static Variables and Methods, Packages.	7	Assignment #3 and/or Midterm and/or Lab Test and/or Final

11	1	Inheritance & Polymorphism:	9	Assignment #3 and/or
		Ch. 9: Inheritance, Implementing Subclasses,		Midterm and/or Lab Test
		Overriding Methods, Polymorphism, the cosmic		and/or Final
		Superclass.		
12	1	Interfaces:	8	Assignment #4, and/or
		8.1 - 8.4, 8.6: Using interfaces for algorithm reuse,		Lab Test and/or Final
		Converting between classes and Interface Types, The		
		Comparable Interface, Inner Classes.		
13	1	Object-Oriented Design:	11,12	Assignment #4, Lab Test
		Ch. 11: Classes and Their Responsibilities,		and/or Final
		Relationships Between Classes, Application: Printing		
		an Invoice		
		Problem solving using Object-Oriented concepts		
		and practice designing good class.		
		Analyze problem requirement and practice: arrays,		
		array list, inheritance, interface, polymorphism,		
		input/output files and exception handling		
14	1	Evention Hondling	0	Final
14	1	Exception Handling Application Handling Input	9	Filial
		Exception Handling, Application: Handling input		
15	1		47	Ein al
15	1	Generic Classes:	17	Final
		1/.1-1/.4: Generic Classes and Type Parameters,		
		Implementing Generic Types, Generic Methods		

VI. Additional Information (e.g., Rubrics, etc.)

Assessment Plan:

Item	Date out/In	Chapters of Weeks	Marks
Lab Exercises	Both attendance and correct submission	1 - 14	10%
	required (best 10 marks counted), lab		
	submission during lab session or end of the day		
Pop Quizzes	Starting from week 3, at the beginning of the	1 - 14	3%
_	lab sessions		
Assignment #1	Week 2/5	1 - 4	3%
Assignment #2	Week 5/8	1 - 8	3%
Midterm	Week 8	1 - 8	17%
	Thu 27-March-2025, time: 5:00 pm		
Assignment #3	Week 8/11	1 – 11	2%
Assignment #4	Week 11/13	1 – 13	2%
Lab Test	Week 14	1 - 13	20%
	Thu 8-May-2025, time 6:15 pm		
	Venue: DCS labs		
Final	Tue 27 th May 2025 (@11:30)	All	40%

Important dates (Mark your calendar):

- Assignment #1 submission: SAT 8-March-2025
- Assignment #2 submission: SAT 29-March-2025
- Assignment #3 submission: SAT 19-April-2025
- Assignment #4 submission: SAT 3-May-2025
- MT exam date: THU 27-March-2025, time: 5 pm
- LT exam date: THU 8-May-2025, time 6:15 pm
- Final exam date: TUE 27-May-2025, time 11:30-14:30

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.

Section	Instructor	Day, Time, and Place	Office Location and Extension	Email	Office Hours (online)
01	Dr. Yassine Al- Jamoussi	MON 12:00 – 1:50 SCI/024 WED 12:00 – 1:50 SCI/024	Office#: 011 Ext: 2464	yessine@squ.edu.om	SUN 08:00-09:50
02	Dr. Ibrahim Dweib	MON 10:00 – 12:00 SCI/19A WED 10:00 – 12:00 SCI/19A	Office#: 000 Ext: 1650	dweib@squ.edu.om	TUE 08:00-09:50
03	Dr. Ibrahim Dweib	MON 2:15 – 4:05 SCI/19B WED 2:15 – 4:05 SCI/19B	Office#: 000 Ext: 1650	dweib@squ.edu.om	THU 08:00-09:50

Instructors of Multiple Sections:

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.

The University expects the students to approach their academic endeavors with
the highest academic integrity. Please refer to the Undergraduate Academic
Regulations.
Students who wish to drop or add the course should review the Undergraduate
Academic Regulations.
Sultan Qaboos University has a clear requirement for students to attend
courses, detailed in the Undergraduate Academic Regulations.
To ensure the provision of a sound and fair assessment and grading, please
review the Undergraduate Academic Regulations.
Students who wish to appeal their grades should review the Undergraduate
Academic Regulations.
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.
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.
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.

Course Outline Appendix

1. PROGRAM LEARNING OUTCOMES / STUDENT OUTCOMES

- 1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
- 2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
- 3. Communicate effectively in a variety of professional contexts.
- 4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
- 5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
- 6. Apply computer science theory and software development fundamentals to produce computing-based solutions.

2. BQU Graduate Attributes and Co	inpetencies 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.	 Demonstrates familiarity and works with advanced specialized knowledge in the area of specialization. Demonstrates a general understanding of the relationship of advanced specialized knowledge with knowledge in other relevant professional fields and aspects. Demonstrates a comprehensive understanding of the theories, principles, and methods used in his/her specialty, and how to create and apply new knowledge. 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
experience that enables him/her to perform all	to evaluate conclusions.
tasks related to the specialization and other	2. Applies appropriate research methods and
related fields.	techniques and employs digital knowledge

2. SQU Graduate Attributes and Competencies for Undergraduate Studies

	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 with	the recipients.
others to achieve the desired results	2. Employs appropriate information and communication technology to collect and analyze information.
D. Autonomy and Leadership: The graduate	1. Performs advanced professional activities
has the ability to lead, make decisions and take	independently.
responsibility for decisions.	2. Demonstrates leadership skills.
	3. 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	2. Demonstrates effective practices when working in
effectively and is committed to the ethics of	teams.
the profession and society.	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	1. Demonstrates the ability to independently manage
graduate has a passion for development and	learning tasks, with an awareness of how to
innovation in the field of specialization.	develop and apply new knowledge.
	2. Utilizes specialized knowledge and skills for
	entrepreneurship.
	3. Utilizes creative and innovative skills in the field
	of specialization.

3. 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