هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

T-104
2022

Course Specification

Course Title: **Object Oriented Programming**	
Course Code: **COMP 214**	
Program: **Bachelor in Computer Science** **Bachelor in Information Technology**	
Department: **Computer Science**	
College: **College of Computer Science and Information Technology**	
Institution: **Jazan University**	
Version: V2	
Last Revision Date: 1 January 2023	

Table of Contents:

A. General information about the course:

Course Identification					
1. Credit hours:	3				
2. Course type					
a.	University ☐	College ☐	Department☒	Track☐	Others☐
b.	Required ☐	Elective☐			
3. Level/year at which this course is offered:	Level 5, 2nd Year				

4. Course general Description

This course provides the fundamental concepts of object-oriented design and implementation of software systems. The list of topics includes the fundamental concepts of classes, objects, methods, object orientation techniques such as abstraction and modularization, code coupling and refactoring, encapsulation, inheritance/subtyping and polymorphism, and abstract data types. Students will acquire basic knowledge on how to translate problem statement into object-oriented software that is easy to maintain (change a feature, remove a feature, fix a bug etc.) and extend.

5. Pre-requirements for this course (if any):
Programming-2 (COMP 213)

6. Co- requirements for this course (if any):

7. Course Main Objective(s)

1. Discuss the philosophy of object-oriented programming.
2. Explain the abstraction mechanisms to support the creation of reusable software components.
3. Explain the modularization mechanisms to solve complicated problems.
4. Illustrate object interactions in real-world problems to come up with straightforward object-oriented solutions.
5. Understand the importance of encapsulation, inheritance/subtyping and polymorphism to improve the design of a software system.
6. Familiarize students with some design principles for maintainable and extendable software.

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	44	80
2.	E-learning		
3.	Hybrid • Traditional classroom • E-learning		
4.	Distance learning(Self Learning)	11	20

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	22
2.	Laboratory/Studio	22
3.	Field	
4.	Tutorial	
5.	Others (specify)	8
	Total	52

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	**Recognize** objects, object behavior, object data and objects as types/subtypes.	K1	Lectures/Presentations and Media lectures	Assignment – 1 Internal exam Final TheoryExam
2.0	Skills			
2.1	**Apply** object-orientation techniques such as encapsulation, inheritance/subtyping and polymorphism to improve program structure.	S1	Lectures /Presentations and Lab demonstration	FinalTheory Exam Assignment-2 Lab Exam
2.2	**Analyze** object interactions of a set of identified objects in a problem	S2	Lectures /Presentations and Lab demonstration	Assignment – 1 Midterm Exam FinalTheory Exam
2.3	**Use** abstraction and modularization principles to solve a problem.	S3	Lectures /Presentations and Lab demonstration	Midterm Exam Lab exam FinalTheory Exam Assignment-1
2.4	**Use** object-orientated design principles to accommodate any future changes to a software system.	S4	Lectures /Presentations and Lab demonstration	Lab exam FinalTheory Exam Assignment-2
3.0	Values, autonomy, and responsibility			
3.1	**Demonstrate** the ability to work in a group to achieve common assignments and activities in the field of computer programming.	V1	Small group discussion / Brainstorming/ Class discussion to train students to think independently	Assignment-2 (Group discussion in the lab)

C. Course Content

No	List of Topics	Contact Hours
1.	**Chapter One: Objects and Classes** ❖ **Lecture 1:** Objects, classes, methods, parameters, ❖ **Lecture 2:** data types, Multiple instances, State, Object interaction.	3T + 3P
2.	**Chapter Two: Understanding Classes** ❖ **Lecture 1:** Fields, constructors, parameters, ❖ **Lecture 2:** methods (accessor, mutator), Fields, parameters,and local variables. ❖ **Self-Study:** Printing from methods, assignment andconditional statement	2T + 2P
3.	**Chapter Three: Object Interaction** ❖ **Lecture 1:** Abstraction, modularization, object creation,Primitive types vs Object Types. ❖ **Lecture 2:** object and class diagrams, Multiple Constructors,method calls. ❖ **Self-Study:** string concatenation, this.	2T + 2P
4.	**Chapter Four: Grouping Objects** ❖ **Lecture 1:** The Collections abstraction, Object structures withCollections. ❖ **Lecture 2:** Generic classes, Numbering within collections. ❖ **Lecture 3**: Processing a whole Collection. ❖ **Lecture 4**: The Track class, The Iterator type ❖ **Self-Study:** null, anonymous objects, Flexible-collection vs Fixed-size collections.	4T + 4P
5.	**Chapter Five: More-sophisticated behavior** ❖ **Lecture 1:** Using library classes, Packages and import,HashMap. ❖ **Lecture 2:** final, public vs private, Class variables andconstants, static keyword ❖ **Self-Study:** String Random, HashSet, Arrays.	2T + 2P
6.	**Chapter Eight: Improving structure with inheritance** ❖ **Lecture 1:** Using inheritance, Inheritance hierarchies, ❖ Inheritance in Java. ❖ **Lecture 2:** Advantages of inheritance, subtyping, substitution,polymorphic variables. ❖ **Lecture 3:** Auto-boxing and Wrapper classes ❖ **Self-Study:** The Object class	4T + 4P

7.	**Chapter Nine: More about Inheritance** ❖ **Lecture 1:** Static type and dynamic type, overriding, ❖ **Lecture 2:** dynamic method lookup, Super call in methods,Method polymorphism, protected access. ❖ **Self-Study:** instanceof, toString	2T + 2P
8.	**Chapter Ten: Further Abstraction Techniques** ❖ **Lecture 1:** Abstract classes, More abstract methods, ❖ **Lecture 2:** Multiple inheritance, interfaces. ❖ **Java constructs to discuss:** abstract, implements, interface	3T + 3P
Total		22T + 22P

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm Exam	6th-7th week	15%
2.	Assignment I	3rd week	15%
3.	Assignment II (Group assignment)	6th-7th week	10%
.4	Lab Exam + Lab Assignment	As per schedule	20%
5.	Final Theory Exam	As per schedule	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Objects First with Java: A Practical Introduction Using BlueJ 6th edition 2017, ISBN-13: 978-0134477367
Supportive References	JAVA: The Complete Reference, Herbert Scheldt, McGraw-Hill, 10th edition 2017, ISBN: 978-1-259-58933-1
Electronic Materials	• www.bluej.org • www.oracle.com › Java › Java SE • https://onecompiler.com/tutorials/java/oops/classes-and-objects • www.coursera.org • www.udacity.com • http://www.horstmann.com/design_and_patterns.html • https://onecompiler.com/tutorials/java/oops/classes-and-objects
Other Learning Materials	Online tutorial

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom equipped with projector and whiteboard and sufficient seating arrangements. Lab with software installed and individual computer terminal for each student
Technology equipment (projector, smart board, software)	Whiteboards and projectors for classroom and lab Following software for lab work: • Java SE 1.8 or later • BlueJ 4.2 for windows.
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect (Course evaluation survey form)
Effectiveness of students assessment	CRC / QAU / HoD	Direct (Course reports / result analysis)
Quality of learning resources	Track leaders / CRC	Indirect (Review, meetings and star rating with suggestions for further modification and improvements)
The extent to which CLOs have been achieved	CRC / QAU	Direct (CLO assessment template further verified at course coordinator, Track leader and QAU level)
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval Data

COUNCIL /COMMITTEE	DEPARTMENT COUNCIL
REFERENCE NO.	
DATE	