هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification

(Bachelor)

Course Title:	Object Oriented Programming
Course Code:	COMP-214
Program:	Bachelor in Computer Science
Department:	Computer Science
College:	College of Computer Science and Information Technology
Institution:	Jazan University
Version:	V2
Last Revision Date:	01 January 2023

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A. General information about the course:

1. Course Identification

1. Credit hours: (03)					
2. Course type					
A.	☐University	☒ College	☒ Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (Level 09)					
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. Pre-requirements for this course (if any)**:**					
No					
7. Course Main Objective(s):					

- Discuss the philosophy of object-oriented programming.
- Explain the abstraction mechanisms to support the creation of reusable software components.
- Explain the modularization mechanisms to solve complicated problems.
- Illustrate object interactions in real-world problems to come up with straightforward object-oriented solutions.
- Understand the importance of encapsulation, inheritance/subtyping and polymorphism to improve the design of a software system.

- Familiarize students with some design principles for maintainable and extendable software.
- Familiarize students with various types of malicious software and attacks on information security and their countermeasures.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning (Self-Learning)		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	28
2.	**Laboratory/Studio**	28
3.	**Field**	--
4.	**Tutorial**	--
5.	**Others (specify)**	8
Total		60

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 Mid exam Final Theory Exam
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	Final Theory 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 Final Theory Exam
2.3	**Use** abstraction and modularization principles to solve a problem.	**S3**	Lectures /Presentations and Lab demonstration	Midterm Exam Lab exam Final Theory Exam Assignment-1
2.4	**Implement** exception handling in object-oriented programming to enhance software reliability and robustness.	**S4**	Lectures /Presentations and Lab demonstration	Lab exam Final Theory 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.	**V2**	Small group discussion / Brainstorming/ Class discussion to train students to think independently	Assignment-2 (Group discussion)

C. Course Content

No	List of Topics	Contact Hours
1.	**Chapter One: Objects and Classes** Objects, classes, methods, parameters, data types, Multiple instances, State, Object interaction. **Understanding Classes** Fields, constructors, parameters, methods (accessor, mutator), Fields, parameters, and local variables. Printing from methods, assignment, and conditional statement.	4T + 4P
2.	**Chapter Two: Object Interaction** Abstraction, modularization, object creation, Primitive types vs Object Types. object and class diagrams, Multiple Constructors, method calls, this keyword. string concatenation, modulo operator.	4T + 4P
3.	**Chapter Three: Grouping Objects** The Collections abstraction, Object structures with Collections. Generic classes, Numbering within collections. Processing a whole Collection. The Track class, The Iterator type null, anonymous objects, Flexible-collection vs Fixed-size collections. **More-sophisticated behavior** Random class, Packages and import, HashMap. final, public vs private, Class variables and constants, static keyword, String, HashSet, Arrays.	6T + 6P
4.	**Chapter Four: Improving structure with inheritance** Using inheritance, Inheritance hierarchies, Inheritance in Java. Advantages of inheritance, subtyping, substitution, polymorphic variables, The Object class, autoboxing, wrapper classes.	6T + 6P
5.	**Chapter Five: More about Inheritance** Static type and dynamic type, overriding, dynamic method lookup, Super call in methods, Method polymorphism, protected access. Further abstraction techniques Abstract classes, More abstract methods, Multiple inheritance, interfaces. Java constructs to discuss: abstract, implements, interface., instanceof, toString.	6T + 6P
Total		26T+26P

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	3th week	10%
3.	Assignment II (Group assignment)	6th-7th week	15%
4.	Lab Exam	11th Week	20%

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
5.	Final Theory Exam	12th Week	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, whiteboard, and sufficient seating arrangements. • Lab with software installed and an 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)

Assessment Areas/Issues	Assessor	Assessment Methods
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		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	DEPARTMENT COUNCIL
REFERENCE NO.	
DATE	15/10/2022