University of Asia Pacific (UAP)

Department of Computer Science and Engineering (CSE)

BSc in CSE Program

Course Outline – Object Oriented Programming I

Part A – Introduction

1. **Course No. / Course Code:** CSE 201

2. **Course Title:** Object-Oriented Programming I

3. **Course Type:** Core Course

4. **Level/Term and Section:** 3rd Semester (2nd Year/1st Semester)

5. **Academic Session:** Fall 24

6. **Course Instructor:** Tanjina Helaly

7. **Prerequisite (If any):** CSE 103

8. **Credit Value:** 3.0

9. **Contact Hours:** 3.0

10. **Total Marks:** 100

11. **Course Objectives and Course Summary:**

    The objectives of this course are to:
    1. Teach OOP principles and features and how to apply them in Java
    2. Teach Inheritance, Encapsulation, Abstraction & Polymorphism in Java
    3. Demonstrate how to properly utilize the Java Exception Handling mechanism and write multithreaded applications.
    4. Show how to use the advanced library ("Collections & Generics" or "STL & Templates").

    This course will cover the main aspects of the Java programming language. Students will learn how to use Java according to proper Object-Oriented Programming principles. This course covers the Java language syntax, and then moves into the object-oriented features of the language. Students

will then learn the OOP principles, Data types, Variables, Scoping and life time of variable, Operators, classes and objects, Inheritance, Abstraction, Exception Handling, Threading, File and StringTokenizer, Networking, I/O streams, Collections API packages

12. **Course Learning Outcomes: at the end of the Course, the Student will be able to –**

CLO 1	**Explain** the basics of Object-Oriented Programming Features.
CLO 2	**Develop** applications using programming language basics.
CLO 3	**Develop** Object-Oriented solutions for programming problems.
CLO 4	**Analyze** and **Debug** program.
CLO 5	**Create** applications using the language-specific library.

13. Mapping / Alignment of CLOs with Program Learning Outcomes (PLO) (Optional):

CLO No.	Corresponding PLOs (Appendix-1)	Bloom's taxonomy domain/level (Appendix-2)	Delivery methods and activities	Assessment Tools
CLO1	1	1/Understand	Lecture, multimedia	Viva, Presentation, Written exam
CLO2	3	1/Apply	Lecture, Problem Analysis, and Implementation.	Quiz, Written exam
CLO3	3	1/Apply	Lecture, Problem Analysis, and Implementation.	Quiz, Written exam
CLO4	2	1/Analyze	Lecture, Problem Analysis, and Implementation.	Quiz, Written Exam
CLO5	3	1/Apply	Lecture, Problem Analysis, and Implementation.	Problem Solving, Written Exam

Part B – Content of the Course

14. Course Content:
15. Alignment of topics of the courses with CLOs:

SL. No	Topics / Content	Course Learning Outcome (CLO)
1	**Language Basic**	**CLO1, CLO2, CLO4**

2	**OOP Basics**	**CLO1, CLO3, CLO4**
3	**OOP Principles: Inheritance, Encapsulation, Polymorphism, Abstraction**	**CLO1, CLO3, CLO4**
4.	**Language Specific library (Exception, Thread, IO, Collections**	**CLO1, CLO4, CLO5**

16. Class Schedule/Lesson Plan/Weekly plan:

Topics	Specific Outcome(s)	Time Frame	Suggested Activities	Teaching Strategy(s)	Alignment with CLO
Introduction to Java and Object Oriented Programming principles, Data types, Variables, Scoping and lifetime of variable	• Understand basic syntax and structure of Java programs • Identify primitive data types and variables • Explain variable scope and lifetime	Week 1	Code walkthroughs, introductory coding exercises, Java setup & environment tasks	Lecture, multimedia	CLO1, CLO2
Arrays: Single and Multidimensional Operators: Arithmetic, The Bitwise Operators, Boolean Logical Operators, Relational Operators, Precedence Control Statements	• Use different types of operators in Java • Implement control flow using if, switch, loops • Declare and manipulate arrays	Week 2		Lecture, multimedia	CLO1, CLO2
Introduction to classes and objects, Constructors and methods. Reference type as parameter and return type. Package, Static keyword, String and String Tokenizer. Wrapper Class	• Create classes and objects • Define and use constructors and methods • Work with Java packages	Week 3-5	CT on Java Basics	Lecture, Problem Solving	CLO1, CLO3, CLO4

	and static members • Use wrapper classes and String utilities				
OOP Features: Inheritance, Encapsulation, Method overloading, Polymorphism, method overriding, Final keyword	• Implement inheritance and encapsulation • Apply polymorphism • Explain use of the final keyword	Week 6-7	CT on Class and Object	Lecture, Problem Solving, Group discussion	CLO1, CLO3, CLO4
MID-TERM EXAMINATION					
Abstraction: abstract class, Interface	• Differentiate between abstract classes and interfaces • Apply abstraction in program design	Week 8	CT on OOP Features. Assignment on Abstraction	Lecture, multimedia	CLO1, CLO3, CLO4
Exception Handling	• Handle runtime errors using try-catch-finally • Define custom exceptions	Week 9		Lecture, multimedia	CLO1, CLO4, CLO5
Nested class, Threading	• Implement inner/nested classes • Create and manage threads using Thread and Runnable	Week 10-11	CT on Exception and Thread	Lecture, multimedia	CLO1, CLO4, CLO5
Input/Output and Serialization	• Read/write files in Java • Implement object	Week 12		Lecture, multimedia	CLO1, CLO4, CLO5

	serialization & deserialization				
Collections and Generics	• Use List, Set, Map interfaces and their implementations • Apply generics for type safety	Week 13-14	CT on IO	Lecture, multimedia	CLO1, CLO4, CLO5
		FINAL EXAMINATION			

17. Teaching-Learning Strategies: Interactive Lectures, Google Classroom

18. Assessment Techniques of each topic of the course:

SL. No	Topics / Content	Assessment Techniques
1	**Language Basic**	Class Test, Written Exam
2	**OOP Basics**	Class Test, Written Exam
3	**OOP Principles: Inheritance, Encapsulation, Polymorphism, Abstraction**	QA Session, Assignment, Class Test, Written Exam
4.	**Language Specific library (Exception, Thread, IO, Collections**	Class Test, Written Exam

Part C – Assessment and Evaluation

19. Assessment Strategy

Class Tests: Altogether 5 class tests may be taken during the semester,3 class tests will be taken for midterm and 2 class tests will be taken for final term. 3 out of 5 class tests will be considered. CT1, best of CT2 & CT3, and best of CT4 & CT5 will be considered. No makeup class tests will be taken. Students are strongly recommended not to miss any class tests.

Assignment: Assignment (Written and/or presentation.) will be given throughout the semester. Late submission will result in a 50% deduction in score. Students will have to do the presentation on the given topic as an assignment.

CIE- Continuous Internal Evaluation (30 Marks)

Bloom's Category Marks (out of 30)	Tests (20)	Assignments (10)
Remember		
Understand		
Apply	**20**	**10**
Analyze		
Evaluate		
Create		

SMEB- Semester Mid & End Examination (70 Marks)

Bloom's Category	Test
Remember	14
Understand	
Apply	42
Analyze	14
Evaluate	
Create	

Weighting COs with Assessment methods:

Assessment Type		Marks Distribution (%)	CO1	CO2	CO3	CO4	CO5
			PO1	PO3	PO3	PO2	PO3
Final Exam (50%)	Written Exam	50	10	10	10	10	10
Mid Term (20%)	Written Exam	20	4	4	8	4	
Assessment (30%)	Assignment/Presentation/Viva	10			10		
	Quiz	20		5	10		5

Total		**100%**	14	19	38	14	15

20. Evaluation Policy

Grades will be calculated as per the university grading structure and individual students will be evaluated based on the following criteria with respective weights.

1. Assessment 30%
2. Term Examination 50%
3. Mid-Term Examination 20%

UAP Grading Policy

Numeric Grade	Letter Grade	Grade Point
80% and above	A+	4.00
75% to less than 80%	A	3.75
70% to less than 75%	A-	3.50
65% to less than 70%	B+	3.25
60% to less than 65%	B	3.00
55% to less than 60%	B-	2.75
50% to less than 55%	C+	2.50
45% to less than 50%	C	2.25
40% to less than 45%	D	2.00
Less than 40%	F	0.00

Part D – Learning Resources

21. Text Book

1. Herbert Schildt and Danny Coward, Java the Complete Reference, 12th edition (2021), McGraw Hill

   Reference Books & Materials
1. Paul Deitel and Harvey M. Deitel,Java: How to Program, 9th Edition (2011),Pearson College Div

2. Kathy Sierra and Bert Bates, Head First Java, 2nd Edition (2005), O'Reilly Media

3. Others