COMSATS University Islamabad
Department of Computer Science
Course Syllabus

Course Information

Course Code: **CSC241**	Course Title: **Object Oriented Programming**
Credit Hours: **4(3,1)**	Lecture Hours/Week: **3**
Lab Hours/Week: **3**	Pre-Requisites: **CSC103-Programming Fundamentals**

Catalogue Description:

This course emphasizes the concepts of object-oriented techniques used in developing computer-based system. The topics include: Overview of Object-Oriented Programming; Classes & its Concepts; Problem Solving in Object Oriented Paradigm; Inheritance; Polymorphism; Library Components; Object Oriented Concepts of File Handling; Swing Classes; Events & Event Handlers; and Canonical Uses.

Text and Reference Books

Textbook:

1. Introduction to Java Programming and Data Structures, Comprehensive Version, Y. Liang, Y. Daniel Liang, Pearson, 2019.

Reference Books:

1. Concise Guide to Object-Oriented Programming, Kingsley Sage, Springer, 2019.
2. Absolute Java, Savitch, W. & Mock, K., Pearson, 2016.

Week wise Plan:

Lecture #	CDF Unit #	Topics Covered	Reading Material
1.	1	Evolution of Object Oriented Programming (OOp); Difference between Object Oriented Approach & Modular/Structural Approach, and Object-Oriented Concepts & Principles.	Liang: Ch10
2.	2	Definition of Classes: Fields & Methods, Creation of Objects, and Understanding State of Object.	Liang: Ch9
3.	2	Defining Constructors, and Concept of Overloaded Constructors.	Liang: Ch9
4.	2	Memory Allocation to Objects, Object as a Reference, Finalizer () Method, and Garbage Collection.	Liang: Ch9
5.	2	Object-Oriented Idioms for Encapsulation: Privacy & Visibility of Class Members, and Package Access.	Liang: Ch9
6.	2	Passing & Returning Objects from Methods, *This* Operator, and Copy Constructors.	Liang: Ch9, Savitch: Ch5
7.	2	Static Data, and Methods.	Liang: Ch9
8.	2	Object Arrays.	Liang: Ch9
9.	2	Immutable Classes, and String as Immutable Class.	Liang: Ch9 & 10
10.	2	Wrapper Classes.	Liang: Ch10
11.	3	Class Diagram, Forward Engineering of Class Diagram to Code, Reverse Engineering of Code to Class Diagram, and Decomposition into Objects.	Liang: Ch9
12.	3	Composition, and Aggregation (Has–A Relationship).	Liang: Ch10
13.	3	Introduction to Inheritance & Subclasses, and Super Keyword.	Liang: Ch11
14.	3	Constructor Chaining, Object-Oriented Idioms for Encapsulation	Liang: Ch11

		(Protected Access Specifier), and Final Modifier.	
15.	3	Method Overriding, and Difference Between Overriding & Overloading.	Liang: Ch11
16.	3	Object Class, and toString () Method.	Liang: Ch11
17.		**Mid Term Exam**	
18.			
19.	4	Polymorphism & Dynamic Binding, Notion of Behavioral Replacement (Subtypes Acting like Super-Types); and Relationship Between Sub-Typing & Inheritance.	Liang: Ch11
20.	4	Down Casting & Up Casting, and Equals () Method of Object Class.	Liang: Ch11
21.	4	Abstract Classes, and Methods.	Liang: Ch13
22.	4	Interfaces & their Usage, and *Comparable* & *Cloneable* Interfaces.	Liang: Ch13
23.	4	Array List Class.	Liang: Ch11
24.	4	Generic Types, and Static & Dynamic Typing.	Liang: Ch19
25.	5	Introduction to File I/O.	Liang: Ch12
26.	5	Binary Files (Object Streaming).	Liang: Ch17
27.	5	Object Serialization.	Liang: Ch17
28.	6	GUI Components (Labels, Buttons, Text Field, Text Areas, Radio Buttons, Combo Box, List View, and Scroll Bar).	Liang: Ch16 & 14
29.	6	Containers, and Layout Managers.	Liang: Ch14
30.	6	Introduction to Event Driven Programming, and Events & Listeners.	Liang: Ch15
31.	6	Listeners as Inner Classes, Anonymous Inner Classes, and Event Handling using Lambda Expression.	Liang: Ch15
32.	6	Using Reactive Framework, Externally-Generated Events, Window Listeners, and Adapter Classes.	Savitch: Ch18
Final Term Exam			

Student Outcomes (SOs)

S.#	Description
1	Apply knowledge of computing fundamentals, knowledge of a computing specialization, and mathematics, science, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements
2	Identify, formulate, research literature, and solve *complex* computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines
3	Design and evaluate solutions for *complex* computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations
4	Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to *complex* computing activities, with an understanding of the limitations
5	Function effectively as an individual and as a member or leader in diverse teams and in multi-disciplinary settings.

9	Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional

Course Learning Outcomes (CLOs)

Sr.#	Unit #	Course Learning Outcomes	Blooms Taxonomy Learning Level	SO
CLO's for Theory				
CLO-1	1-2	Explain the concepts of Object-Oriented Programming (OOP) paradigms.	*Understanding*	1
CLO-2	3-4	Design an Object-Oriented model for a real-world problem.	*Creating*	2,3
CLO-3	3-4	Prepare a program reflecting Object-Oriented concepts.	*Applying*	2-4
CLO's for Lab				
CLO-4	3-4	Implement a small module utilizing Object-Oriented design.	*Applying*	2-4
CLO-5	1-6	Develop a GUI based project for a real-world problem in a team environment.	*Creating*	2-5,9

CLO Assessment Mechanism

Assessment Tools	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5
Quizzes	Quiz 1	Quiz 2	Quiz 3&4	-	-
Assignments	Assignment 1	Assignment 2	Assignment 3&4	Lab Assignments	Lab Assignments
Mid Term Exam	Mid Term Exam	Mid Term Exam	Mid Term Exam	-	-
Final Term Exam	Final Term Exam			-	-
Project	-	-	-	-	Lab Project

Policy & Procedures

- **Attendance Policy:** Every student must attend 80% of the lectures as well as laboratory in this course. The students falling short of required percentage of attendance of lectures/laboratory work, is not allowed to appear in the terminal examination.

- **Course Assessment:**

	Quizzes	Assignments	Mid Term Exam	Terminal Exam	Total
Theory (T)	15	10	25	50	100
Lab (L)	-	25	25	50	100
Final Marks (T+L)	**(T/100) *75 + (L/100) *25**				

- **Grading Policy:** The minimum passing marks for each course is 50% (In case of LAB; in addition to theory, student is also required to obtain 50% marks in the lab to pass the course). The correspondence between letter grades, credit points, and percentage marks at CUI is as follows:

Grade	**A**	**A-**	**B+**	**B**	**B-**	**C+**	**C**	**C-**	**D+**	**D**	**F**
Marks	>= 85	80 - 84	75 - 79	71 - 74	68 - 70	64 - 67	61 - 63	58 - 60	54 - 57	50-53	< 50
Cr. Point	3.67-4.00	3.34-3.66	3.01-3.33	2.67-3.00	2.34-2.66	2.01-2.33	1.67-2.00	1.31-1.66	1.01-1.30	0.10-1.00	0.00

- **Missing Exam:** No makeup exam will be given for final exam under any circumstance. When a student misses the mid-term exam for a legitimate reason (such as medical emergencies), his grade for this exam will be determined based on the Department policy. Further, the student must provide an official excuse within one week of the missed exam.
- **Academic Integrity:** All CUI policies regarding ethics apply to this course. The students are advised to discuss their grievances/problems with their counsellors or course instructor in a respectful manner.
- **Plagiarism Policy:** Plagiarism, copying and any other dishonest behaviour is prohibited by the rules and regulations of CUI. Violators will face serious consequences.