CSE 208L – Object Oriented Programming Lab
University of Engineering & Technology Peshawar
Fall 2020

Instructor:	Sumayyea Salahuddin
Laboratory Hours:	Wed, 08:00–11:00 am (LAB#2, A)
	Thurs, 08:00–11:00 am (LAB#2, C)
	Fri, 08:00–11:00 am (LAB#2, B)
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Course Description

The objective of this lab course is to transform the student's programming approach from structured programming to object-oriented programming. Thereby, making the students think in an object-oriented way by strengthening their concepts of classes, objects, inheritance, and abstraction.

Course Learning Objectives

1. Develop and polish professional programming skills by designing object-oriented solutions for real life and engineering problems.
2. Practically implement the core concepts of object-oriented programming, taught in theory course, such as Data Hiding, Data Encapsulation, Data Abstraction, Inheritance, Lists and Systems based on object identity, using latest programming tools.
3. Design and analyze various algorithmic strategies for a given problem scenario, using an object-oriented paradigm, keeping the system requirements and constraints under consideration.
4. Work both individually and as team on various object-oriented paradigm projects using modern programming tools.

Learning Resources for Students

OOP RECOMMENDED BOOKS:

Robert Lafore, *Object-Oriented Programming in C++*, 4th Edition, CourseSams Publishing
Deitel & Deitel, *C++ How to Program*, 9th/10th Edition, Pearson Publishing

Following Google Classroom provides the dissemination of course-related announcements, documents (lab course outline, results), lab material, projects, and lists of recommended readings and online learning resources.

https://classroom.google.com/c/MTY2OTc4MTU1Mjcz?cjc=cprrqhe

Google Classroom code is: **cprrqhe**

Grading Criteria

Lab Reports & Performance:	10%
Lab Midterm Examination:	15%
Lab Final Examination:	25%
Lab Project & Viva:	50%

Note: Project will be judged according to following parameters – idea, team work, code, presentation, and report.

Tentative Week-Wise Course Outline

Week	Contents
Week 1	**Object Programming Essentials [Part 1]** 1. Classes and Objects 2. Access Specifiers 3. Data Members and Member Functions 4. Constructors 5. Constructor Overloading 6. "this" pointer
Week 2	**Object Programming Essentials [Part 2]** 1. Passing Objects in Function Arguments 2. Returning Objects From Functions 3. Cascaded Function Calls 4. A Stack: A View from Two Different Perspectives 5. Copy Constructor 6. Memory Leaks 7. Destructors 8. "auto" keyword **OOP Lab Project Proposal Announcement & Submission Deadline**
Week 3	**Object Programming Essentials [Part 3]** 1. Static Class Components 2. Static vs. Non-Static Components 3. Const Members and Objects 4. Objects vs. pointers and objects inside the objects **Lab 1, 2, and 3 cover the essential concepts of Object Oriented Programming and contains the topics taken from CISCO Network Academy. At the end of this lab, students will be able to take the CISCO Chapter 5 – Object Programming Essential Module and cover it successfully.**

Week 4	**Deep Copy and Shallow Copy** 1. Dynamic Memory Allocation 2. Deep Copy 3. Shallow Copy
Week 5	**Implementing the Concept of Inheritance** 1. Base and Derived Classes 2. Types of Inheritance 3. Type Compatibility 4. Passing an object as a function parameter 5. Passing an object by value 6. Passing an object of a subclass 7. The dynamic_cast operator
Week 6	**Multiple and Multilevel Inheritance** 1. Function Overriding 2. Multiple Inheritance 3. Multilevel Inheritance 4. Composition 5. Multi-file Programming
Week 7	**Friend Functions and Friend Classes** 1. More on Const Keyword 2. Friend Functions 3. Friend Classes
Week 8	**Polymorphism and Virtual Functions** 1. Basics of Polymorphism 2. Virtual Functions 3. Concrete Classes 4. Abstract Classes **Lab 4, 5, 6, 7, and 8 cover the inheritance in detail and contains the topics taken from CISCO Network Academy. At the end of this lab, students will be able to take the CISCO Chapter 6 – Inheritance Module and cover it successfully.**
Mid Term Week	
Week 9	**Project Week 1: Progress + Midterm Lab Examination**
Week 10	**Templates and Exceptions** 1. Function Templates 2. Class Templates 3. Exceptions 4. Throw Statement in Detail

Week 11	**More on Exceptions** 1. Categorizing Exceptions 2. Catching Exceptions 3. Exceptions in Action **Lab 10 and 11 covers the templates and exceptions in object-oriented programming and contains the topics taken from CISCO Network Academy. At the end of this lab, students will be able to take the CISCO Chapter 7 – Exception Module available and cover it successfully.**
Week 12	**Project Week 2: Progress**
Week 13	**Operator Overloading** 1. Operator Overloading Basics 2. Enumerated Types 3. Arithmetic Operators 4. Bitwise Operators 5. Assignment Operators 6. Relational Operators 7. Logical Operators 8. Unary Operators 9. Other Operators **Lab 13 covers the concept of operator overloading and contains the topics taken from CISCO Network Academy. At the end of this lab, students will be able to take the CISCO Chapter 8 – Operators and Enumerated Types Module and cover it successfully.**
Week 14	**Open Ended Lab**
Week 15	**OOP Lab Project Presentation and Report Submission**
Week 16	**Revision**
Final Term Week	
Project Exhibition/Finalterm Lab Examination	

Note: At the end of the lab course, both mock test and final test will be conducted. Students completing the tests will be awarded the certificates respectively for each test from CISCO Network Academy.

CLOs and its Mapping with PLOs

CLO #	CLO	Cognitive Domain	PLOs
CLO-1	Use object oriented programming for problem solving rather than using procedural programming	C3 (Application)	PLO3 (Design/ Development of Solutions)
CLO-2	Practice and demonstrate object oriented programming concepts using integrated development environment	C3(Application)	PLO5 (Modern Tool Usage)
CLO-3	Work effectively on a selected object oriented programming project.	C3 (Application)	PLO9 (Individual & Team Work)

CLOs Assessment Mechanism

Assessment Tools	CLO1	CLO2	CLO3
Lab Reports	✓	✓	
Mid Term	✓		
Final Term		✓	
Lab Viva			
Semester Project			✓

Points to Remember

Missing Lab (Excused Absence):

- For maximum of 3 excused absences, written test of lab content will be taken on student request.

Lab Report Submission:

- Due by 8:30 am, before the start of next lab every week.
- To be collected by Class Representative & provided to the Instructor.
- Personal submission by individual students is not entertained and if lab report gone missing in such scenario, instructor is not responsible.

Turning in late Lab Report:

- Not accepted.

Phones & Other Distractions:

- During lab duration students may not use phones to talk, text or for any other purpose. Laptops or class room machines may only be used for tasks related to the lab in progress. Misuse of phones or

computers during lab will result in a 10% penalty on the following exam.

- Non-class activity such as checking email, social media, games, etc. during lab is not allowed.

Attendance:

- You are expected to attend all the labs. I will take attendance. After 3 unexcused absences your course grade will be lowered by 10 points. After 7 unexcused absences you will be withdrawn from the course.

Academic Integrity:

- Honesty and integrity are characteristics that should describe each one of us as servants of Allah. As your instructor, I pledge that I will strive for honesty and integrity in how I handle the content of this course and in how I interact with each of you. I ask that you join me in pledging to do the same.
- Academic dishonesty will result in penalties up to and including dismissal from the class with a failing grade and will be reported to the Semester Coordinator/Chairman. All instances of dishonesty will be handled according to the procedures delineated in the UET Peshawar prospectus.
- Each student is expected to do his/her own work. Copying of others' assignments is NOT permitted. Working in groups, when not instructed to do so is not permitted.
- Phones and other electronic devices are not permitted during exams and in-lab quizzes. Use of these will at minimum result in a failing grade for the assignment.

Time Management Expectations:

- For every lab, the typical student should expect to spend at least two clock hours a week of problem solving, reading, practicing, preparing for coming exams/quizzes and other activities that enhance learning.
