



CS1004 – Object Oriented Programming

A. Course Description

Course Code	CS-1004
Course Title	Object Oriented Programming
Credit Hours	3+1
Prerequisites by Course(s) and Topics	CS1002-Programming Fundamentals
Assessment Instruments with Weights (homework, quizzes, midterms, final, programming assignments, lab work, etc.)	Quizzes: 10 Assignment: 15 Mid-1:12.5 Mid-2:12.5 Project: 05 Class Taks: 05 Final:40
Course Coordinator	Rizwan UI Haq
URL (if any)	
Current Catalog Description	
Textbook (or Laboratory Manual for Laboratory Courses)	<ul style="list-style-type: none"> Object-Oriented Programming in C++ (Robert Lafore) Object C++ How to program (Deitel & Deitel)
Reference Material	<ul style="list-style-type: none"> C++ Programming: From Problem Analysis to Program Design (D. S. Malik) The C++ Programming Language (Bjarne Stroustrup)

Course Goals	<ol style="list-style-type: none"> Understand the basic concepts of OOP. Apply OOP concepts(Encapsulation, Inheritance, Polymorphism, Abstraction) to computing problems for the related program Model an algorithmic solution for a given problem using OOP Apply good programming practices 	
Topics Covered in the Course, with Number of Lectures on Each Topic (assume 15-week instruction and one & half-hour lectures)	Week wise distribution	Topics Covered
	Week 1	<ul style="list-style-type: none"> Course Introduction Revision of Basic C++ Concepts
	Week 2	<ul style="list-style-type: none"> Pointers in C++ Pointer Variable Declarations and Initialization Referencing/Dereferencing, Pointer Arithmetic Pointers & Functions

	Week 3	<ul style="list-style-type: none"> Dynamic Memory Allocation Dynamic Variables Dynamic Multi-dimensional Arrays Shallow Copy vs. Deep Copy
	Week 4	<ul style="list-style-type: none"> Structures in C++ Language Member Variables & Member Functions Arrays vs. Structures and Arrays of Structures Structs and Pointer Variables
	Week 5	<ul style="list-style-type: none"> Recursion Object Oriented Programing (OOP) & Procedural Programming Object-Oriented Design (OOD) and OOP Intro to Classes & Objects Member Functions: Access Functions (Accessors and Mutators) Utility Functions Separating interface from implementation (3 File structures)
	Week 6	Mid1
	Week 7	<ul style="list-style-type: none"> Static members and functions Constant members and this pointer
	Week 8	<ul style="list-style-type: none"> Constructor, Destructor Data Abstraction, Classes, and Abstract Data Types, & A struct Versus a class Classes and Pointer Variables Copy Constructor, Overloading Constructors Shallow Copy & Deep Copy (w.r.t. Objects) Inheritance
	Week 9	<ul style="list-style-type: none"> Function Overriding/Redefining Inheritance – Multiple inheritance – Ambiguity errors with detailed examples. Types of inheritance (Public, Private & Protected)
	Week 10	<ul style="list-style-type: none"> Composition: Association & Aggregation Friend Functions and classes
	Week 11	Mid2
	Week 12	<ul style="list-style-type: none"> Operator overloading – overview Operator overloading - overloading basic operators with detailed examples. Operator overloading and Friend functions.
	Week 13	<ul style="list-style-type: none"> Polymorphism – Introduction (Virtual functions) Polymorphism Abstract and concrete classes Abstract Classes & pure Virtual Functions (Interface vs. Implementation)
	Week 14	<ul style="list-style-type: none"> C++ Templates – Introduction and usage with detailed examples
	Week 15	<ul style="list-style-type: none"> Exception handling - Introduction

			<ul style="list-style-type: none"> Exception handling -Built-in exception classes and creating your own exception classes 	
	Week 16		<ul style="list-style-type: none"> Advance Topics (STL , MVC) (Optional) Reserved for revision 	
Class Time Spent on (in credit hours)	Theory	Problem Analysis	Solution Design	Social and Ethical Issues
	15%	50%	30%	5%
<p>Academic Integrity</p> <p>Zero tolerance on cheating as per NUCES Policies. All Cases (in any Assessment Instruments) will be referred to department committee.</p>	<p>Plagiarism is strictly prohibited and would be strictly dealt with. Late submission of assignment will be allowed until its solution is discussed. It is better to partially attempt what you understand and submit remaining as late, than to copy from someone else or internet.</p> <ul style="list-style-type: none"> - Max Grade penalty of 50% (in assignment) for late submit. - Min Grade penalty of 100% (in course) for plagiarism. <p>When taking help in your assignments (from web)</p> <ul style="list-style-type: none"> - Cite reference clearly, mentioning URL and content taken. - Even if referred, it is still plagiarism to use the same sentence or change it in active/passive form. Use your own words, ALWAYS!. <p>When taking help in your assignments (from peers)</p> <ul style="list-style-type: none"> - Discussing assignments with peers is allowed only on discussion group. Do not provide excuses later. - Provide help in form of explaining problem rather than explaining solution. Group discussion is encouraged. 			
<p>Evaluation Policy</p> <p>For NUCES Policies please read the student handbook.</p>	<ul style="list-style-type: none"> - Attendance and Quizzes will might be held in start of class. - Exams may be open book (closed notes). Please do NOT write or mark anything on the book. - There will be NO compensation for missed quiz. - All graded evaluations will be property of the instructor. - Take classes only with your section, assigned by NU CS dept. - IMPORTANT: Always send me same day EMAIL reminder if I give you any verbal comment e.g class participation bonus, late submission allowed, leave allowed, average marks etc. 			

Instructions / Suggestions for STUDENTS for satisfactory progress in this course:

- On average, most students find at least three hours outside of class for each class hour necessary for satisfactory learning.
- The homework assigned is a minimum. You should always work extra hours on your own.
- Use the few minutes you usually have before the start of each class to review the prior meetings' notes and homework. This will save us valuable in-class time to work on new material.
- Develop a learning habit rather than memorizing; work in groups, whenever appropriate.
- Apply the learned principles and gained knowledge; be creative in thinking.
- Assignments/ Activities: They are not meant simply for grades, but to reinforce your learning. Assignments are due on time. Each day late will lower your assignment grade by 30%. You can submit assignment till three days later after submission date