



# University of Management and Technology

School of Commerce and Accountancy

Quaid e Azam Campus

## Course Outline

<b>Course Title: Object-oriented Programming (CS251)</b>	
<b>Program</b>	ADP(CS)
<b>Credits Hours</b>	3
<b>Duration</b>	15 Weeks / 30 Sessions
<b>Prerequisites</b>	
<b>Resource Person</b>	
<b>Contact/Email</b>	

## Course Description:

The goal of this course is to teach you object oriented programming in C++ and also to familiarize you with the most commonly used libraries and OOP constructs. We will use C++ as the underlying language in this course. C++ is among the most widely used and most successful languages for the programming of large scale software applications.

## Learning Objectives:

Upon successful completion of this course students should be able to:

- Understand a problem for a programmable task from its description
- Model a solution to a programmable task in terms of objects
- Translate the solution to a programmable task into an object-oriented program in C++
- Understand and apply the C++ language constructs and tools in programming
- Understand and use common C++ libraries in programming

## Teaching-Learning Methodology:

***Note: Select methodologies as per nature of the course.***

- Lectures
- Recommended Text/Supplementary Texts
- Handouts
- Case Studies
- Skill Development Exercises
- Project Report/Term Paper
- Any other Teaching Tool.....

**Recommended Text Book:**

1. C++ How to Program, 7<sup>th</sup> Edition  
By: Deitel and Deitel.

Link

<https://csssubjects.skoze.com/wp-content/uploads/2015/01/c-how-to-program-7th-edition.pdf>

**Reference Book:**

1. C++ The Complete Reference, By: Herbert Schildt
2. Object-oriented Programming in C++, By: Robert Lafore

**Assessment & Evaluation:**

*Note: Please Specify the Weightage you want to assign to assignments and Final Project/ Project presentation/Presentation.*

Quizzes	<b>15%</b>
Assignments	} 20%
Final Project	
Project Presentation/Presentations	
Mid Term	<b>25%</b>
<u>End Term Exam</u>	<u><b>40%</b></u>
<b>Total:</b>	<b>100</b>

## SEHEDULE OF ACTIVITIES

*Note: Please fill the tasks/activities column according to your course plan*

Week	Contents/Topics to be Taught	Tasks/Activities
1	<b>Introduction</b> <ul style="list-style-type: none"> <li>■ C Programming Language Review                             <ul style="list-style-type: none"> <li>○ Defining Functions</li> <li>○ Defining Structures</li> </ul> </li> <li>■ Writing a class</li> <li>■ Examples</li> </ul>	Course Outline Distribution
2	<b>Object-oriented Concepts</b> <ul style="list-style-type: none"> <li>■ Encapsulation</li> <li>■ Inheritance</li> <li>■ Polymorphism</li> </ul> <b>Defining Classes in C++</b> <ul style="list-style-type: none"> <li>■ Classes and Objects</li> <li>■</li> </ul>	
3	<ul style="list-style-type: none"> <li>■ Constructors</li> <li>■ Default Constructor</li> <li>■ “this” pointer</li> </ul>	
4	<b>Defining and Using Classes in C++</b> <ul style="list-style-type: none"> <li>■ Getter/Setter Functions</li> <li>■ Copy Constructor</li> <li>■ Function Overloading</li> <li>■ Overloaded Constructors</li> <li>■ Instances, Variables and Scope</li> <li>■ Examples</li> </ul>	Quiz 1
5	<b>Inheritance</b> <ul style="list-style-type: none"> <li>■ Deriving classes from other classes</li> <li>■ Inheritance Types: Public/Private/Protected</li> <li>■ Function Overriding</li> <li>■ Examples</li> </ul>	Assignment 1
6	<b>Multiple Inheritance and Polymorphism</b> <ul style="list-style-type: none"> <li>■ Multiple Inheritance</li> <li>■ Polymorphism</li> <li>■ Virtual functions</li> <li>■ Abstract classes</li> <li>■ Examples</li> </ul>	Assignment 2

7	<b>Class Hierarchies, Friends, Operator Overloading</b> <ul style="list-style-type: none"> <li>▪ Class Hierarchies</li> <li>▪ Diamond Problem</li> <li>▪ Friend keyword</li> <li>▪ Friend usage</li> <li>▪ Overloading vs Overriding</li> <li>▪ Operator Overloading</li> <li>▪ Examples</li> </ul>	Quiz 2
8	<b>Dynamic Allocation</b> <ul style="list-style-type: none"> <li>▪ Dynamic allocation, new/delete</li> <li>▪ Allocating Objects</li> <li>▪ Allocation using Pointers</li> <li>▪ Allocation and Copy Constructor</li> <li>▪ Memory Leakage Issues</li> </ul>	
9	<b>Streams</b> <ul style="list-style-type: none"> <li>▪ I/O streams: cout/cin, using ios flags and formatting I/O</li> <li>▪ Reading and Writing files using file streams</li> </ul>	
10	<b>Introduction</b> <ul style="list-style-type: none"> <li>▪ C Programming Language Review <ul style="list-style-type: none"> <li>○ Defining Functions</li> <li>○ Defining Structures</li> </ul> </li> <li>▪ Writing a class</li> <li>▪ Examples</li> </ul>	
11	<b>Object-oriented Concepts</b> <ul style="list-style-type: none"> <li>▪ Encapsulation</li> <li>▪ Inheritance</li> <li>▪ Polymorphism</li> </ul> <b>Defining Classes in C++</b> <ul style="list-style-type: none"> <li>▪ Classes and Objects</li> <li>▪ Constructors</li> <li>▪ Default Constructor</li> <li>▪ “this” pointer</li> </ul>	Quiz 3
12	<b>Defining and Using Classes in C++</b> <ul style="list-style-type: none"> <li>▪ Getter/Setter Functions</li> <li>▪ Copy Constructor</li> <li>▪ Function Overloading</li> <li>▪ Overloaded Constructors</li> <li>▪ Instances, Variables and Scope</li> <li>▪ Examples</li> </ul>	

13	<b>Inheritance</b> <ul style="list-style-type: none"> <li>▪ Deriving classes from other classes</li> <li>▪ Inheritance Types: Public/Private/Protected</li> <li>▪ Function Overriding</li> <li>▪ Examples</li> </ul>	Quiz 4
15	<b>Multiple Inheritance and Polymorphism</b> <ul style="list-style-type: none"> <li>▪ Multiple Inheritance</li> <li>▪ Polymorphism</li> <li>▪ Virtual functions</li> <li>▪ Abstract classes</li> <li>▪ Examples</li> </ul>	Assignment 4 Presentations (if any)
16	<b>END TERM EXAMINATION</b>	