

## Module (Object Oriented Programming) Catalogue 2023-2024

College/ Institute	Erbil Technology College	
Department	Information & Communication Technology Engineering (ICTE)	
Module Name	Object Oriented Programming	
Module Code	OOP301	
Degree	Technical Diploma <input checked="" type="checkbox"/> Bachelor <input checked="" type="checkbox"/> High Diploma <input type="checkbox"/> Master <input type="checkbox"/> PhD <input type="checkbox"/>	
Semester	Fourth Semester	
Qualification	Ph.D.	
Scientific Title	Lecturer	
ECTS (Credits)	4	
Module type	Prerequisite <input type="checkbox"/> Core <input checked="" type="checkbox"/> Assist. <input type="checkbox"/>	
Weekly hours	4	
Weekly hours (Theory)	(2)hr Class	(91)Total hrs Workload
Weekly hours (Practical)	(2)hr Class	(71)Total hrs Workload
Number of Weeks	15	
Lecturer (Theory)	Chiman haidar salh	
E-Mail & Mobile NO.	Chiman.salh@epu.edu.iq	
Lecturer (Practical)	Chiman haidar salh	
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Websites		

# Course Book

<b>Course Description</b>	<p>This course could be considered as main course where basic concepts will be explained. These concepts are frequently repeated in the other programs. From the nineties to the present day, world has witnessed rapid development and prosperity in the field of science especially in the field of information technology. As a result of this rapid development, people must provide the means and mechanisms to control and organize this information. Electronic device are designed and operated by one of operating system which developing by one of the programming language such as: C, C++, C#, Visual Basic and so on. Therefore any operating system or any application programs' that you want to create it in the purpose of executing any specific job must be made by one of those programming languages which classified as a high level language. C++ is an important programming language to create application program, Therefore you need to know or learning the basic concepts in the C++ language to create this kind of programs. Then you have to have a good background in C++ because this will be your fundamental step and help you to learn easily the Object Oriented Programming in second stage. Finally the programming considered as a backbone for computer science.</p>
<b>Course objectives</b>	<p>This course gives students an opportunity to know the basic concepts in programming specially the fundamentals steps and how to writing a program in C++ language, So in this course the student will learn how to build flow chart for any program and how to convert it to program and vice versa, also will get a good information about variables and constants and how to deal with them and also will learn how to apply the operator and mathematical operations' in C++ languages. Additionally, This course is the base part in understanding other programming languages.</p>
<b>Student's obligation</b>	<p>The Students should be attendant in class at less than 1:30 hours during lecturing and to pass this course should be fulfilled the following requirements:</p> <ol style="list-style-type: none"><li>1. The student has to submit almost all assignments, essays and reports and also.</li><li>2. The student must be passing the exams and quizzes which have been done during study year.</li><li>3. Students attending classes regularly.</li><li>4. Group work.</li><li>5. Doing assignments.</li><li>6. Class activities.</li></ol>

<b>Required Learning Materials</b>	<p>The ways that we are using in our teaching for this course are:</p> <ol style="list-style-type: none"> <li>1. Data show.</li> <li>2. White Board.</li> <li>3. Word Documents.</li> <li>4. Notebook.</li> <li>5. Group activity</li> <li>6. Computer Lab</li> </ol>				
<b>Evaluation</b>	<b>Task</b>	<b>Weight (Marks)</b>	<b>Due Week</b>	<b>Relevant Learning Outcome</b>	
	Paper Review	0			
	Assignments	Homework	5		
		Class Activity	2		
		Report	5		
		Seminar	5		
		Essay	0		
		Project	0		
	Quiz	8			
	Lab.	10			
	Midterm Exam	25			
	Final Exam	40			
	Total	100			
<b>Specific learning outcome:</b>	<p>1.Exploring how to deal with variables, constants, loops and conditional statements which are consider important part in programming. Where C++ language using in Data Manipulation and also using in various programming fields and different programs for solving any issue in different area.</p> <p>2.Improve students skills in programming by writing many programs in different ways and learning how to analysis the data and solve the issue separately in many ways.</p>				
<b>Course References:</b>	<p>1. Object Oriented Programming with C++ (E.BALAGURUSAMY).  2. Object Oriented Programming in C++ (Robert Lafore).  Useful references:  1. A GETWAY TO THE C++ LANGUAGE. ( ARAM M. KHAYAT, 2008)  2. Fundamental of C++ Programming and Numerical Analysis (Twana Kamal Hagi, 2008). ▪  Magazines and review (internet):  1. <a href="http://www.cplusplus.com/doc/tutorial">http://www.cplusplus.com/doc/tutorial</a>  2. <a href="http://www.cprogramming.com/tutorial.html">www.cprogramming.com/tutorial.html</a>  3. <a href="http://www.4shared">http://www.4shared</a></p>				

<b>Course topics (Theory)</b>	<b>Week</b>	<b>Learning Outcome</b>
Introduction: What is Object Oriented Programming? What is an Object? Sequential operation	1	A look at Procedure-Oriented Programming • The basic concepts of Object Oriented Programming (OOP) <ul style="list-style-type: none"> <li>• Benefits of OOP</li> <li>• OOP Languages</li> <li>• OOP Applications</li> </ul>
Quick Review: Main Fundamental steps in C++, Data Types, Declaration Of Variables, Constant (Dynamic Initialization Of Variables) and Operators and Arithmetic Operations. *Conditional Statements (If statements, advanced If statements and Switch Cases). Iteration or repeating structure loops (For, While and Do.. While) and differences between break and continue in loop structures.	2	Data Types, Variable, Operators ,If, For, While and Do.. While
Function, Overloading Function	3	Function
Struct, using Struct in the function and Nested structure	4	Structure
Struct, using Struct in the function and Nested structure	5	Nested structure
Union in C++	6	Union
*Object -Oriented Paradigm: Data Abstraction, Encapsulation, Polymorphism and Inheritance. *Classes and Objects: Program with Class and Determining Class.	7,8	Classes and Objects
Constructor and Destructor	9	Constructor and Destructor
Inheritance and Inheritance Types: Single inheritance. Multiple inheritance and Hierarchy inheritance. Multilevel inheritance and Hybrid inheritance.	10,11	Inheritance
Encapsulation, Polymorphism	12	Polymorphism
Nested Function In OOP, Virtual Function, Pure Virtual Function, Virtual Class (Static Variable & Function in OOP) and Friend Function	13	Friend Function, Friend Class
<b>Practical Topics</b>	<b>Week</b>	<b>Learning Outcome</b>
Detail of the topics, Visual Studio's Explaining, Navigation, Entrance to C++, how to creating project in C++ and how to Save & open C++ Source Files.	1	Visual Studio Programming
Quick Review: Main Fundamental steps in C++, Data Types, Declaration Of Variables, Constant (Dynamic Initialization Of Variables) and Operators and Arithmetic Operations.	2,3	Data Types, Variable, Operators ,If

*Conditional Statements (If statements, advanced If statements and Switch Cases).		
Function, Overloading Function	3	Function
Struct, using Struct in the function and Nested structure	4	Structure
Struct, using Struct in the function and Nested structure	5	Nested structure
Union in C++	6	Union
*Object -Oriented Paradigm: Data Abstraction, Encapsulation, Polymorphism and Inheritance. *Classes and Objects: Program with Class and Determining Class.	7,8	Classes and Objects
Constructor and Destructor	9	Constructor and Destructor
Inheritance and Inheritance Types: Single inheritance. Multiple inheritance and Hierarchy inheritance. Multilevel inheritance and Hybrid inheritance.	10,11	Inheritance
Encapsulation, Polymorphism	12	Polymorphism
Nested Function In OOP, Virtual Function, Pure Virtual Function, Virtual Class (Static Variable & Function in OOP) and Friend Function	13	Friend Function, Friend Class

## Questions Example Design

1. Compositional:

Q1/A computer language is object-oriented if they support the four specific object properties called ....., ....., ..... and .....

Ans.: abstraction, encapsulation, polymorphism, and inheritance.

Q2/ Write pprogram to create Box's class which contains (length, width and high) and also includes: construct function, size function and destructor function.

```
#include<iostream>
using namespace std;
class Box {
int length, width, high; public:
Box(int a, int b, int c); int size( );
Box( );
};
Box::Box(int a , int b, int c)
{ length=a; width=b; high int Box::size()
{ return(length*width*high); } Box::~~Box( )
{ cout<<"The object is destroyed "<<endl; getchar(); }
void main()
{ Box B1 (3,5,7), B2 (4,6,8); int z; z=B1.size();
cout<<z<<endl; z=B2.size(); cout<<z<<endl; }
```

Q3/True or false type of exams:

1. Multiple Inheritances: It is the inheritance hierarchy wherein subclass acts as a base class for other classes. (False)
  2. Private members of the base class are inaccessible to the derived class. (True)
  3. Encapsulation it gives a clear separation between properties of data type and the associated implementation details. (False)
3. Multiple choices: Q/ 1. each string is terminated with one of the following character:  
a. \* , b. '\0' , c. '\n'
2. In multiple inheritance there is/are :  
a. Only one base class , b. Only two base class, c. multi base class.

### Extra notes:

Please take this note into consideration:

Making the topics covered in the semester compatible with reality of the educational process due to the national and religious holiday or other reasons. For instance, covering more than 80% of the prescribed subjects to improve the scientific level of students and preserve the standardization of diploma programs.

### External Evaluator

I have reviewed this course book, it's perfect and fit for this subject in the level of institute student, so I have no suggestion.

Zanyar Shwan Ahmed

Lecture (Erbil Technology College) Information Communication Technology Engineering  
Department

