زانكۆی پۆلیتەكنیكی هەولێر
ERBIL POLYTECHNIC UNIVERSITY

Kurdistan Region Government
Ministry of Higher Education
and Scientific Research
Erbil Polytechnic University

Module (Object Oriented Programming) Catalogue

2022-2023

College/ Institute	Khabat Technical Institute	
Department	Information technology	
Module Name	Object Oriented Programming	
Module Code		
Degree	Technical Diploma ✖ Bachelor .. High Diploma ☐ Master ☐ PhD ☐	
Semester	Third Semester	
Qualification	Master's degree in computer science	
Scientific Title	Assistant Lecturer	
ECTS (Credits)	6	
Module type	Prerequisite ☐ Core ✖ Assist. ☐	
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	12	
Lecturer (Theory)	Didar Rashad	
E-Mail & Mobile NO.	didar.qadr@epu.edu.iq	
Lecturer (Practical)	Aram jawdat , Azad , Nashmil	
E-Mail & Mobile NO.		
Websites		

Course Book

Course Description	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.
Course objectives	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.
Student's obligation	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: 1. The student has to submit almost all assignments, essays and reports and also. 2. The student must be passing the exams and quizzes which have been done during study year. 3. Students attending classes regularly. 4. Group work. 5.Doing assignments. 6.Class activities.

Required Learning Materials	The ways that we are using in our teaching for this course are: 1. Data show. 2. White Board. 3. Word Documents. 4. Notebook. 5. Group activity 6. Computer Lab			
Evaluation	**Task**		**Weight (Marks)**	**Due Week**	**Relevant Learning Outcome**
	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		
Specific learning outcome:	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. 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.			
Course References:	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. http://www.cplusplus.com/doc/tutorial 2. www.cprogramming.com/tutorial.html 3. http://www.4shared			

Course topics (Theory)	Week	Learning Outcome
Introduction: What is Object Oriented Programming? What is an Object? Sequential operation	1,2	A look at Procedure-Oriented Programming • The basic concepts of Object Oriented Programming (OOP) • Benefits of OOP • OOP Languages • OOP Applications • Why OOP
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.	3,4	Data Types, Variable, Operators ,If, For, While and Do.. While
*Array, Matrix and Strings. *Pointers: Variable Pointer, Assignment Pointer, Pointer with array.	5	Array, String, Pointer
Functions (Function's Parts: Prototype Part, Calling Function, Definition of Function and Parameters), Recursion Function, Calling by Reference Or calling by value and some templates of function (Prepared Functions').	6,7	Function
Functions (Function's Parts: Prototype Part, Calling Function, Definition of Function and Parameters), Recursion Function, Calling by Reference Or calling by value and some templates of function (Prepared Functions').	8	Function
Struct, using Struct in the function and Nested structure	9	Structure
*Object -Oriented Paradigm: Data Abstraction, Encapsulation, Polymorphism and Inheritance. *Classes and Objects: Program with Class and Determining Class.	10,11	Classes and Objects
Constructor and Destructor	12	Constructor and Destructor
Inheritance and Inheritance Types: Single inheritance. Multiple inheritance and Hierarchy inheritance. Multilevel inheritance and Hybrid inheritance.	13	Inheritance
Encapsulation, Polymorphism	14	Polymorphism
Nested Function In OOP, Virtual Function, Pure Virtual Function, Virtual Class (Static Variable & Function in OOP) and Friend Function	15	Friend Function, Friend Class
Practical Topics	**Week**	**Learning Outcome**
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. *Conditional Statements (If statements, advanced If statements and Switch Cases).	2,3	Data Types, Variable, Operators ,If
Iteration or repeating structure loops (For, While and Do.. While) and differences between break and continue in loop structures.	4	For, While and Do.. While
*Array, Matrix and Strings. *Pointers: Variable Pointer, Assignment Pointer, Pointer with array.	5,6	Array, String, Pointer
Functions (Function's Parts: Prototype Part, Calling Function, Definition of Function and Parameters), Recursion Function, Calling by Reference Or calling by value and some templates of function (Prepared Functions').	7	Function
Functions (Function's Parts: Prototype Part, Calling Function, Definition of Function and Parameters), Recursion Function, Calling by Reference Or calling by value and some templates of function (Prepared Functions').	8	Function
Struct, using Struct in the function and Nested structure	9	Structure
*Object-Oriented Paradigm: Data Abstraction, Encapsulation, Polymorphism and Inheritance. *Classes and Objects: Program with Class and Determining Class.	10	Classes and Objects
Constructor and Destructor	11	Constructor and Destructor
Inheritance and Inheritance Types: Single inheritance. Multiple inheritance and Hierarchy inheritance. Multilevel inheritance and Hybrid inheritance.	12	Inheritance
Encapsulation, Polymorphism	13	Polymorphism
Nested Function In OOP, Virtual Function, Pure Virtual Function, Virtual Class (Static Variable & Function in OOP) and Friend Function	14,15	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.