

Course specification

(2103 Object Oriented Programming)

Faculty:	<i>HICIT- Higher Institute for Computers & Information Technology-El Shorouk Academy</i>
Programme(s) on which the course is given:	Under graduate program in Computer Science
Major or minor element of programme:	Compulsory
Department offering the programme	Department of Computer Science
Department offering the course:	Department of Computer Science
Year / Class	2 rd Year – 1 st semester
Date of specification approval	1/8/2022

A- Basic Information

Title: Object Oriented Programming	Code: 2103		
Weekly Hours:			
Lecture: 3	Exercise: -	Practical: 4	Total: 7

B- Professional Information

1- Course Objectives:

This module builds on students' previous knowledge of basic programming to provide an introductory approach to object-oriented software development. Fundamentals of classes and objects as key features of programming in terms of design and implementation will be emphasized. Collection objects are also covered and the availability of library classes as building blocks. In addition, students will learn how polymorphism can reduce software production time and implement software re-usability.

After completing this course, the student should be able to:

- Build and manipulate with classes.
- using objects.
- implement the inheritance and polymorphism concepts.

2- Program ILOs Covered by Course

Program Intended Learning Outcomes			
Knowledge and understanding	Intellectual Skills	Professional and practical skills	General and Transferable skills
A2, A11, A13, A20	B3, B4	C1, C5, C10, C16	D5

3 - Intended learning outcomes of course (ILOs)

After Completing this course the student must demonstrate the Knowledge and ability to:

a: Knowledge and Understanding

Upon successful completion of this course, graduates should be able to:

- a1- Understand and apply a wide range of principles and tools available to the object oriented Programming.[A11,A20]
- a2- Defining classes and Using objects[A13]
- a3- Identify and understand the fundamental concepts, principles and theories of a class, object, polymorphism, and inheritance.[A11,A13,A20]
- a4- Identify the concepts of inheritance and polymorphism.[A2,A20]
- a5- Define the Abstract classes, Interfaces and OO Model.[A2,A20]

b: Intellectual skills

Upon successful completion of this course, graduates should be able to:

- b1-Analyze a problem in object-oriented concept.[B3,B4]
- b2-Build independent modules (classes and objects) that can be used in different programs.[B3,B4]

c: Professional and practical skills

- c1- Implement and develop an object-oriented program efficiently.[C16]
- c2- Reuse the classes that were built during his practical work in computer lab to develop a bigger project.[C5,C10]
- c3- Practice a range of software development tools (e.g. text editor and compiler);[C16]
- c4- Implement features of an object-oriented programming language (e.g. inheritance, polymorphism to write programs);[C5]
- c5- Design appropriate interfaces between modular components;[C1,C5]

d: General and transferable skills

- d1- Learn some Internet/Library searching strategies.[D5]
- d2- write a short report using appropriate scientific language.[D5]
- d3. Use IT skills and display mature computer literacy.[D5]

4- Contents

Topic	Hours	Lec.	Exc/Lab
The conceptual basis of Object Orientated Programming	7	3	4
Introduction to the Unified Modeling Language.	7	3	4
Primitive data types and data types as objects. Data Abstraction and encapsulation	14	6	8
Classes and object as abstract data types. Message passing.	7	3	4
An object-oriented programming language syntax, creating objects from class definitions (e.g. C#).	7	3	4
Operators, Operator overloading, delegates, and events	14	6	8
Object oriented programming : Inheritance Access control, Method hiding. Virtual methods and dynamic binding, method overriding	14	6	8

Object oriented programming : Polymorphism, Abstract class, Interface	7	3	4
Exception handling	5	2	3
Selected Topics	2	2	-
Course Project	7	3	4

5- Teaching and learning methods

Teaching and learning methods	Used
Active Learning	
Lectures(blending learning – online learning using virtual classroom)	√
Tutorial Exercises (hybrid learning – online learning)	√
Practical Lab(blending learning– online learning)	√
Exercises	
Discussions.	√
Self – Learning strategy	
Reading material	√
Websites search	√
Research and reporting	√
Self-studies	√
Experimental strategy	
Group work	√
Presentation	
Problem solving strategy	
Problem solving/problem solving learning based	√
Case study	√
Synchronous E-Learning	
Virtual lab	-
Virtual class	-
Chat Room	-
Video lectures	√
Asynchronous E-Learning	
E-Learning	√
Blending learning	
	-

6 -Student assessment methods

Methods	Assessment	Used
Electronic Midterm Exam	To assess the knowledge and understanding achieved by the student during the previous weeks. (online on e-learning hub)	√
Pencil-to-Paper Final Exam	To evaluate what the student gain at the end of the course, and to assess: the knowledge and understanding, general skills, and intellectual skills.	√
Course Project	To allow students work in team, and to evaluate knowledge, understanding, intellectual, and transferable skills. (online on e-learning hub , FTF)	√
Electronic Course Work & Quizzes	To keep the student always in the course, and to evaluate knowledge, understanding, intellectual, and transferable skills.(online on e-learning hub)	√
Practical Exam	to measure the ability of students to design and implement a software program(FTF).	√
Participation	To assess the knowledge and understanding achieved by the student during the previous weeks.	√

Assessment Schedule

Assessment	Week #
Participation	3-14
Electronic Mid Term Exam	8
Final Exam	16
Electronic/ hard copy Course Project	3-14
Electronic/ hard copy Course Work & Quizzes	2-14
Practical Exam	15

Assessment Weight

Assessment	Weight %
Participation	5%
Electronic Mid Term Exam	
Final Exam	70%
Electronic / hard copy Course Project	10%
Electronic/ hard copy Course Work & Quizzes	5%
Practical Exam	10%
Total	100

Course Work & Quizzes:

- Short Exams, Assignments, Researches, Reports, Presentations on e-learning hub
- Class/Project discussion in a virtual classroom

7- List of references

Essential books (text books)	<ul style="list-style-type: none"> • Deitel, H., & Deitel, P. (2017, March 20). Visual C# How to Program, Global Edition. • Fowler, M. (2018, September 6). UML Distilled: A Brief Guide to the Standard Object Modeling Language.
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Internet Location	<ul style="list-style-type: none"> • http://msdn.microsoft.com/en-us/vcsharp/default.aspx • http://en.wikipedia.org/wiki/C_Sharp • http://en.wikipedia.org/wiki/C_Sharp_(programming_language) • http://functionx.com/csharp/index.htm • http://www.csharp-station.com/Tutorial.aspx
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Periodicals, website **Powerpoint presentations of all course materials**
All labs material
[\[https://moodle.sha.edu.eg/course/view.php?id=1359\]](https://moodle.sha.edu.eg/course/view.php?id=1359)

8- Required Facilities

To assess professional and practical skills given the following facilities:

- a. Tools & SW (Technologies facilities):
 - **Visual Studio 2019**
 - **Microsoft TEAMS to create virtual classrooms for lectures, discussions for project**
 - **portal(MOODLE) to make electronic quizzes and electronic midterm exam**
 - **portal(MOODLE) to upload project deliverable and assignment**
 - **academy portal(MOODLE) to upload electronic material**
- b. Teaching facilities:

	<i>Lecture</i>	<i>class</i>	<i>Lab</i>
Whiteboard	used	-	used
Pc/laptop	used	-	used
Data show	used	-	used
Webinars	MS TEAMS	-	MS TEAMS
SocialMedia	Facebook Page for 2 nd year	-	Facebook Page for 2 nd year
ChatRoom	ChatTeams	-	ChatTeams
Videos	Stream-MOODLE	-	Stream-MOODLE
Website	MOODLE	-	MOODLE

9-Course Matrices

9.1-Course Content/ILO Matrix

Course Contents	Knowledge & understanding					Intellectual skills		Professional and practical skills				General		
	a1	a2	a3	a4	a5	b1	b2	c1	c2	c3	c4	d1	d2	d3
Primitive data types and data types as objects. Data Abstraction and encapsulation	x													
Classes and object as abstract data types. Message passing.		x												
An object-oriented programming language syntax, creating objects from class definitions (e.g. C#).		x	x											
Operators, Operator overloading, delegates, and events				x										
Object oriented programming : Inheritance Access control, Method hiding. Virtual methods and dynamic binding, method overriding				x		x	x		x	x				
Object oriented programming : Polymorphism, Abstract class, Interface					x	x	x	x		x	x			
Exception handling								x			x			
Course Project												x	x	x
Selected Topics	x	x	x											

9.2-Learning Method /ILO Matrix

Learning Methods	Knowledge & understanding					Intellectual skills		Professional and practical skills				General		
	a1	a2	a3	a4	a5	b1	b2	c1	c2	c3	c4	d1	d2	d3
Lectures	x	x	x	x	x	x	x	x	x	x	x			
Tutorial Exercises						x	x	x	x	x	x			
Practical Lab								x	x	x	x			
Discussions						x	x	x	x	x	x	x	x	x
Reading material	x	x	x	x	x	x	x	x	x	x	x			
Websites search	x	x	x	x	x	x	x	x		x			x	x
Research and reporting	x	x	x	x									x	x
Self-studies	x	x	x	x	x	x	x	x	x	x	x			
Group work												x	x	x
Problem solving/problem solving learning based						x	x							
Case study	x	x	x	x	x	x	x	x	x	x	x			
Video lectures	x	x	x	x	x	x	x	x	x	x	x			
E-Learning	x	x	x	x	x	x	x	x	x	x	x			

9.3-Assessment Methods /ILO Matrix

Assessment Methods	Knowledge & understanding				Intellectual skills				Professional & practical skills				General				
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4	d5
Electronic Mid Term Exam	x	x	x	x	x	x	x	x									
Final Exam	x	x	x	x	x	x	x	x									
Electronic Course Project	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Electronic Course Work & Quizzes	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Practical Exam									x	x	x	x					

10- Course ILOs Vs Program ILOs

Course ILOs \ Prog ILOs		Knowledge & understanding				Intellectual skills		Professional & practical skills				General	
		A2	A11	A13	A20	B3	B4	C1	C5	C10	C16	D5	
K&U	a1		√		√								
	a2			√	√								
	a3		√	√	√								
	a4	√			√								
	a5	√			√								
Int.	b1					√	√						
	b2					√	√						
P. & P.	c1											√	
	c2								√	√			
	c3											√	
	c4								√				
	c5							√	√				
General	d1												√
	d2												√
	d3												√

Course coordinator: Dr Mohamed Hussein()

Head of Department: Dr. Ahmed El-Abbassy ()

Date: 1/8/2022