



Future Academy
Higher Future Institute for Specialized Technological Studies

Course Specification

1- Course information:

Course Code:	CSC211
Course Title:	Programming Lang. (2)
Year/level	2 nd
Academic Programs	Computer Science Program (B.Sc.)
Contact hours/ week	(Theoretical = 3hrs, Practical = 3hrs), Total = 6hrs

2- Course aims:

This course aims to provide students with comprehensive knowledge regarding the principles of object-oriented programming design and advanced algorithmic problem solving through an object-oriented programming language. Through this course a lot of topics will be covered such as encapsulation, data hiding, classes, objects, polymorphism; inheritance, Superclasses, and subclasses; as well as the creation, implementation, and the reuse of other built classes.

3- Intended learning outcomes of the course (ILOs):

a- Knowledge and understanding:

On successful completion of this course, the student should be able to:

- a1- **Recognize** the main difference among Structured-based Programming, Function-based Programming and Object Oriented Programming
- a2- **Define** the basic concepts of passing parameters to functions outside the main functions
- a3- **Determine** the basic concepts and the importance of using array
- a4- **Identify** the main concepts of Object-Oriented Programming such as encapsulation. code reusability, inheritance and Polymorphism
- a5- **Present** the basic difference of OOP elements such as, access specifier, constructors, destructors, function overloading, function overriding.
- a6- **Recognize** the importance of operator overloading methodology

b- Intellectual skills:

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

b1- **Describe** the requirements of computer based systems using OOP concepts

b2- **Develop** a wide range of problems using OOP Paradigm

b3- **Design** programs using Structured-based Programming, Function-based Programming or Object Oriented Programming

c- Professional and practical skills:

At the end of this course, the student will be able to:

c1- **Examine** static and dynamic one-dimension and two-dimension arrays, as well as, apply a different sorting and searching algorithms on the created array

c2- **Prepare** a wide range of programs using Function-based Programming or OOP –based Programming

c3- **Utilize** programs using the principles of inheritance and polymorphism

d- General and transferable skills:

On successful completion of this course, the student should be able to:

d1- **Compute** the personal responsibility by working to multiple deadlines in relation to the course requirements.

d2- **Working in groups** to the deployment of communication skills.

4- Course contents

Week No.	Topics/units	Number of hours		ILO's
		Lecture hours	Practical hours	
1	Revision on the basic concepts of Structured Programming	2	2	a1, b1, c2, d2
2	Building programs using Function, passing parameters by value and by Reference	2	2	a2, b1, b2, c2
3	Storing values in Static and Dynamics in 1-D array and 2-D array	2	2	a3, b3, c1, d1
4	Introduction to Object-Oriented Programming concepts + Quiz 1	2	2	a4, b1, c2
5	Implementing classes ,objects and Encapsulation concepts	2	2	a4, b1, c2
6	Using Default Constructor and Parameterized Constructor	2	2	a5, b2, c2
7	Midterm Exam			
8	Using Constructor overloading			a5, b2, c2

9	Introduction to Inheritance , building programs using Base classes and Derived classes	2	2	a4, b2, c3, d1
10	Advanced inheritance topics, function overriding	2	2	b2, c3, d1
11	Distribute Programs into Header files and CPP files to establish the principle of code usability Code Reusability +Quiz 2	2	2	a1, b1
12	Using Local, Global and Static variables with/without classes	2	2	a1, d1
13	Operator Overloading “Unary operators”	2	2	a6, b3,c2, c3, d2
14	Operator Overloading “Binary operators”	2	2	a6, b2, c2, d2

5- Teaching and learning methods

Methods	ILO's													
	a1	a2	a3	a4	a5	a6	b1	b2	b3	c1	c2	c3	d1	d2
Lectures	√	√	√	√	√	√	√		√					
Practical sections								√		√	√	√		
Self-learning														√
Problem solving							√	√		√	√	√		
Assays and reviews														
Discussion groups													√	
Brainstorming														
Blended-learning														
E-learning														

6- Teaching and learning methods for Low-achieving students

- Additional teaching hours for those who need help.
- More quizzes to assess their ability for understanding the course.

- Encourage the teamwork for those students with other advanced ones to increase their participation and understanding.

7- Student assessment

Assessment method	Time	Grade weight (%)	Week	ILOs
Course Work (Tutorial Exercise and Assignments)	Through the semester	10	Every Week	a1, a2, a3, a4, b2, b3, c2, c3, d1, d2
Quiz 1	Through the lecture	5	Week#4	a1, a2, a3, b1, b3, c2
Mid-term exam	1 hours	10	Week#7	a1, a2, c2, c3
Quiz 2	Through the lecture	5	Week#11	a4, a5, b2 , c3
Practical exam	2 hours	10	Week#14	a3, b2, b3, c1, c2, c3
Final Written exam	2 hours	60	Week# 15-16	a1, a2, a4, a5, a6, b3

8-List of references

8.1. Student notebooks:

- Comprehensive instructor notes ("PowerPoint slides") are available on the course web page ("Google Classroom")

8.2. Essential textbooks:

- Object-Oriented Programming in C++, Robert lafore, Fourth Edition, ISBN-13: 978-0672323089, 2002
- Big C++: Late Objects, Cay S. Horstmann ,Third Edition, ISBN-13: 978-1119739678

8.3. Recommended textbooks:

- Python 3 Object-Oriented Programming, Phillips, Dusty, Third Edition, ISBN-13: 978-1789615852, 2018

8.4. Journals, Periodical and Reportsetc.

8.5. Websites

- <https://www.geeksforgeeks.org/c-plus-plus/>
- <https://www.w3schools.com/cpp/default.asp>
- <https://www.learncpp.com/>

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