



## Ministry of Higher Education and Scientific Research

Republic of Iraq

University: University of Basrah

College: Science

Department: Physics



Year: 2023-2024

Semester: First

SYLLABUS: < Programming in VC++ >

**INSTRUCTOR:** Asst. Prof. Dr. Mohammad Mohsen Ali

**Phone:** +964 7802179823

**Hours:** 3

**Office:** Department of Physics

**Home Page:** [faculty.uobasrah.edu.iq/faculty/2229](http://faculty.uobasrah.edu.iq/faculty/2229)

**Email:** [mohammad.mohsein@uobasrah.edu.iq](mailto:mohammad.mohsein@uobasrah.edu.iq)

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### COURSE OVERVIEW

The course aims to introduce the student to programming in VC++

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### GOALS AND OBJECTIVES

- ✓ The main objective of this course is to introduce the student to the basics of building different programs using the VC++ language on the basis of building an integrated framework for building different applications that can be used in various computer disciplines.
- ✓ Explain how the computer deals with the programming language and how it organizes variables and programming commands and organizes them in memory devices.
- ✓ Develop students' skills in dealing with computers through the application of different programs that clarify the structure of programming.
  
- ✓ Teaching the student, the importance of the computer at the present time and in the future, and the progress of the pace of development in this field, and how to keep pace with it.
  
- ✓ To make the student acquire practical skills for applying VC++ programs.
- ✓ VC++ language applications:
  - a- Desktop Application Programming: It has been widely used in building operating systems such as (Windows 95/98 and UNIX).
  - b- Artificial intelligence applications.
  - c- Robotics / Arduino: The electronic brain of the robot can be made using the C++ language, especially on the Arduino board.
  - d- Game Programming: C++ can be used to program very powerful games with Unreal Engine etc...

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## TEXTBOOK AND READINGS

- [1] Elixir In C++ Language, By Sultan Mohammed
- [2] C++ Quick Guide, By Basil Al Ramo and Samir Ezzo
- [3]

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## COURSE ASSESSMENTS

The course grade (**100** points) will be based on the following elements:

Points

Exams	<b>Final Exam (40), Practical Final Exam (20), Monthly Exams (27)</b>
Reading Checks	<b>1</b>
Participation	<b>1</b>
Attendance	<b>1</b>
Assignments	<b>10</b>

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## COURSE DESCRIPTION AND ASSIGNMENT SCHEDULE

This **NO.** 3-credit hour course is 15 weeks long. You should invest **NO.2** hours every week in this course and 3-hour laboratory.

WK	DATE	TOPIC	READING	ASSIGNMENT
1	28/9/2023	Introduction to C++ Language	The chapter shows how to use C++ and the general body of the program, as well as learn about the symbols used, words and identifiers, the rules for naming them, and the representation of constants in this language. This chapter then show how numerical and string variables are defined and how to assign values to them in the program, also touch on the tools used in the C++ language.	Assignment 1
2	5/10/2023	Introduction to VC++ Language	In this part of the chapter, shows how numerical variables are used in arithmetic, relational (comparative) and equality operators, as well as logical operations and their impact on the program and its results. In the last part of this chapter, shows how to deal with the operators represented by the (conditional) question operator, the comma operator and the explicit throw (subtraction) operator. We also learn the usefulness of the sizeof() operator for numerical and symbolic variable types and how important it is in affecting memory size. In the last part of this chapter, we explain the precedence of operations and the input and output entity and their use in C++ programs.	Assignment 2
3	12/10/2023	Office (mathematical) functions, constants, decision-making sentences, and optional sentences	In this chapter, we learn how to express many mathematical functions and use them in simple and complex operations to reduce the difficulty of those operations. We also discuss the use of constants and the process of defining them to reduce the number and size of the program steps. We also address the decision-making sentences and their	Assignment 3

			extreme importance in reaching the desired goal of the program with high accuracy and with fewer steps, and we also show the importance of using the optional sentence and its wide use in many life and academic applications, such as the examination committee program.	
4	19/10/2023	Cumulative summation, goto statement, repetition loops	This chapter shows the importance of cumulative summation and how to use it in the jump statement and repetition loops, which has a significant impact in reducing the program steps and its impact on mathematical operations. The last section in the chapter discuss the types of repetition loops and their importance in solving many mathematical equations and complex series.	Assignment 4
5	26/10/2023	Nested repetition loops (Multiple), break and continue statements	This part of the chapter discusses the use of nested repetition loops and their importance in many simple and complex mathematical and physical applications, as well as their use in extracting different shapes and their importance later in matrices and functions of different types. This chapter also deals with the statements of break and continue and their importance in limiting the repetition of steps in implementation.	Assignment 5
6	2/11/2023	<b>The First Monthly Exam</b>		
7	9/11/2023	Arrays and their types	This chapter shows the definition, declaration and types of matrices (one-dimensional and two-dimensional matrices). The last section shows how to set the values of the matrix and its role in solving many diverse problems, including mathematical and physical ...etc. of applications.	Assignment 6
8	16/11/2023	Strings (strings arrays) and entrance to functions	The chapter shows how strings are handled and their importance in the formation of ID cards and many other applications. The second section discuss functions and their building, and the first type of them, which are functions that return a specific value to the general program. The last section shows how to create a function file by the user and how to save the function in a file, and then use it as a built-in function.	Assignment 7
9	23/11/2023	User-defined functions and function file	The chapter shows how mathematical functions are defined using the method of unknown functions and built-in functions. As well as types of functions, including functions that return values to the general program corresponding to reference values in it and functions with one name and for more than one type (overload functions). The last section in the chapter introduces sub-functions and nested functions.	Assignment 8
10	30/11/2023	Data Structures	This chapter shows how to deal with structures and information about the structure and its use in the inclusion of extensive information about people, companies or institutions, as well as its use in mathematical calculations. This chapter then discuss the definition of a structure within another structure (the nested structures) and its applications.	Assignment 9
11	7/12/2023	Files and their use with structures and functions	In this chapter, we show how to create a file by the user, how to read and write to the file, as well as how to save the structure and function in a file, and then use it as a ready function.	Assignment 10

12	14/12/2023	<b>The Second Monthly Exam</b>		
13	21/12/2023	Pointers / Pointers and Arrays / Pointers and Functions	The chapter shows the importance of pointers and the way to deal with them, define them and use them with matrices (the pointers matrix), as well as using them with functions. As well as the use of arithmetic operators with pointers.	Assignment 11
14	28/12/2023	Classes, Constructors and Destructors	This chapter shows how to deal with classes, which is one of the tools that emerge from the structured data, where the classes can contain both data and functions. Also, the chapter show the role and importance of constructors and destructors classes in many operations.	Assignment 12
15	4/1/2023	Friendship and inheritance	This chapter shows how to look at friendly functions and friendly classes and show how to redefine operators to work with new types. Also, the chapter talk about the concept of inheritance and how inheritance provides the reusability of classes.	Assignment 12
<b>Final Exam</b>				

Is it possible to develop the curriculum <within the teaching authority 20%> to include vocabulary that serves sustainability	
1- Yes, it is possible (point an appropriate aspect)	<p><b>1-</b> Fighting poverty <b>2-</b> No hunger <b>3-</b> Developing life-long learning and education <b>4-</b> Green chemistry <b>5-</b> Sustainable development <b>6-</b> Water purification <b>7-</b> Water recycling for agriculture <b>8-</b> Creativity and production <b>9-</b> Sustainable energy (wind Sun and organic energy) <b>10-</b> Environmental development- <b>11-</b> pollution measurement <b>12-</b> child care program-<b>13-</b> public health development program-<b>14-</b> measuring the efficiency of health institutions-<b>15-</b> gender equality-<b>16-</b> non-extremism-<b>17-</b> drug efficiency <b>18-</b> Food efficiency for infants, children, adults and the elderly <b>19-</b> Efficiency of the overall environment <b>20-</b> Waste recycling-<b>21-</b> Heavy water disposal mechanisms-<b>22-</b> Literacy program-<b>23-</b> Mechanisms for preserving biodiversity-<b>24-</b> Mechanisms for spreading peace and justice in society- <b>25-</b> Developing life in the seas and oceans-<b>26-</b> Studying the level of university education and the mechanisms for its development-<b>27-</b> Mechanisms for developing the local industry in Iraq-<b>28-</b> Mechanisms for developing infrastructure in Iraq-<b>29-</b>Reducing racial discrimination in all its forms-<b>30-</b>The basics of sustainable cities- <b>31-</b> Mechanisms to reduce consumption and increase production- <b>32-</b> Mechanisms to provide job opportunities for all-<b>33-</b> Study aspects of developing green areas-<b>34-</b> Study climatic phenomena in the country-<b>35-</b> Mechanisms for obtaining good health and well-being.</p>
2- Suggest aspect that serves sustainability	