Programming Essentials
(UOMU022023)

اساسيات البرمجة
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Introduction

by
Dr Murtada Dohan
murtada.dohan@uomus.edu.iq

Agenda

- Personal Information
- Module Aim
- Learning Outcomes
- Module outline
- Assessments
- Development Environment
- Resources

Who, Where and When?

- **Dr Murtada Dohan**, Researcher and Lecturer in College of Engineering.
  - murtdada.dohan@uomus.edu.iq use [Programming Essentials] prefix in email subject
- Education:
  - BSc Software Engineering (University of Northampton, UK)
  - MSc Software Engineering (University of Northampton, UK)
  - PhD in AI & VR (University of Northampton, UK)
- **Teaching Expertise**
  - Artificial Intelligence, Computer Vision, Data Structures..
- **Research**
  - Virtual Reality, Human Attention, Machine Learning
- **Supervision**
  - Accepting dissertation students

Module Aim

- To develop problem solving skills and understanding of programming principles.

- To understand the logic behind programming.

- This course include using C++ as a programming language.

- This course include algorithm design.

- To understand how a programmer should prepare his work and think logically.

- To perform programming project using control statements, functions, and to deal with the data stored in an array or file.
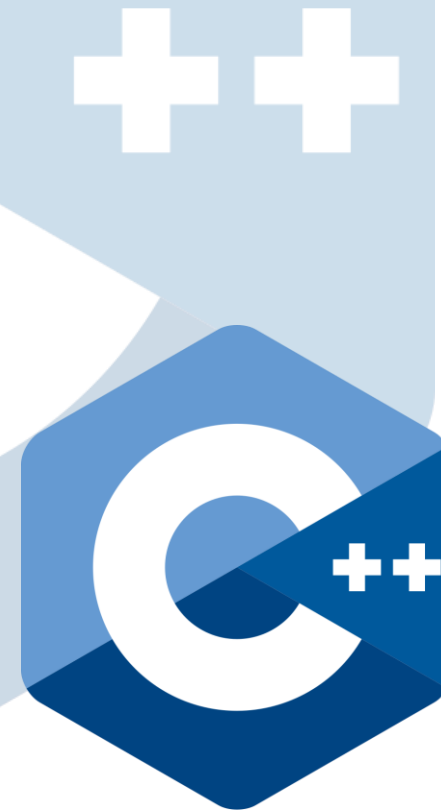
Learning Outcomes

- Use of algorithms (Flowchart specifically).

- Explain how the program is written using C++ Programming language.

- Define and use of variables (Data types, Declaration of variables).

- Use of operators and its precedence (Assignment, Arithmetic operators, Relational and Logical operators, Bitwise Operators, Increment and decrement, Cast operator, and Conditional operator).

- Making Decisions (use of: if, if-else, and switch statements) and draw of Flowchart of if-else statement.

- Use of Loops (for, while, do-while), and use of break and continue statements with loops, and draw of Flowchart of loops.

- Use of Arrays (one and two dimensional).

- Use of Functions (Built-in function functions (Library functions), and User Defined functions).

- Use of arguments passed by value and by reference, and use of Local and global variables.

- Use of Character sequences and string handling.

- Handling and processing text files in C++.

Module outline

week semesters	Topic
Week 1	Intro to C++
Week 2	Intro to Compilers
Week 3	Flowchart
Week 4	Variables
Week 5	Control Structures 1
Week 6	Control Structures 2
Week 7	Mid Assessment
Week 8	Loops 1
Week 9	Loops 2
Week 10	Functions 1
Week 11	Functions 2
Week 12	Arrays 1D
Week 13	Arrays nD
Week 14	Arrays nD
Week 15	Revision

Assessments

- **Formative 40%**
  - Quizzes x 2
  - Project x 1
  - Homework x 1
  - Reports x 2
- **Mid**
  - 10%
- **Final**
  - 50%

Development Environment

- https://visualstudio.microsoft.com/downloads/

IDE Options (Free Download)

- Visual Studio (Community Version) – Windows only

- Code::Blocks (Windows only)

- Xcode (Mac only)

- CodeLite (Windows/Linux/Mac)

- Eclipse

- Online C++ Shell (cpp.sh,…)

Resources

- Books:
  - C++ How to Program, 6th Edition 2007 By P. J. Deitel – Deitel & Associates, Inc., H. M. Deitel – Deitel & Associates, Inc.
  - Starting Out with Programming Logic and Design (What's New in Computer Science), 5th Edition 2018 By Tony Gaddis
- Websites:
  - https://www.w3schools.com/cpp
  - https://www.geeksforgeeks.org/c-plus-plus
  - https://en.cppreference.com/

Let's try C++

Install Visual Studio (VS) and familiarise yourself with its interface.