Programming in C++

ECTS: 3 ECTS

COORDINATOR: Ana María Ferreiro Ferreiro (ana.fferreiro@udc.es)

UNIVERSITY WHERE THE COORDINATOR IS: UDC

HAVE YOU GIVEN PERMISSION TO RECORD YOUR CLASSES? Yes

LECTURER 1: Ana María Ferreiro Ferreiro (ana.fferreiro@udc.es)

UNIVERSITY WHERE THE LECTURER 1 IS: UDC

HAVE YOU GIVEN PERMISSION TO RECORD YOUR CLASSES? Yes

LECTURER 2: José Antonio García Rodríguez (jose.garcia.rodriguez@udc.es)

UNIVERSITY WHERE THE LECTURER 2 IS: UDC

HAVE YOU GIVEN PERMISSION TO RECORD YOUR CLASSES? Yes

SUBJECT CONTENTS

Unit 1: The C++ programming language.

- Introduction to programming in C++.

- Basic data types.

- Keyboard and files I/O .

- Control sentences.

- Dynamic memory management: pointers.

- Structures.

- Functions. Overloading.

Unit 2: Object Oriented Programming in C++.

- Introduction to Object Oriented Programming (OOP).

- Classes and instances (objects).

- Operator overloading.

- Friend functions and classes.

- Inheritance.

- Polymorphism.

- Templates.

Unit 3: Standard Template Library (STL).

- Introduction to STL.

- STL containers and iterators.

- Basic STL containers management.

METHODOLOGY

a) Theory classes: In the theory classes the syntax of the C++ programming languaje will be studied together with the Object Oriented Programming paradigm, and the C++ syntax necesary to translate POO ideas into C++ code.

b) Laboratory practices: Practical guided classes where the students will put into practice the theoretical concepts studied in the theory classes.

Theory and practical classes will be mixed in order to ease the learning experience.

c) Guided essays: Projects and exercises applied to numerical computing that must be presented by the students and help to better understand the subject.

LANGUAGE USED IN CLASS: Spanish

IS IT COMPULSORY TO ATTEND CLASS? Students can attend via conference system, It is not compulsory

BIBLIOGRAPHY

- Harvey M. Deitel, Paul J. Deitel (2009). C++ : cómo programar (6ª ed.). Pearson Educación

- Bjarne Stroustrup ([2001] (2007 reimp.)). El Lenguaje de programación C++ . Addison-Wesley Iberoamericana

- Walter Savitch (2004). Problem Solving with C++: The Object of Programming, Fifth Edition . Addison-Wesley

- Ray Lischner (2003). C++ In a Nutshell. O'Reilly Media.

SKILLS

Basic:

CG1: To have knowledge that provide a basis or opportunity for originality in developing and / or applying ideas, often within a research context, knowing how to translate industrial needs in terms of R & D in the field of mathematics Industrial.

CG3: To be able to integrate knowledge in order to state opinions using information that even incomplete or limited, include reflecting on social and ethical responsibilities linked to the application of their knowledge.

Specific:

CE4: To be able to select a set of numerical techniques, languages and tools, appropriate to solve a mathematical model.

CE5: To be able to validate and interpret the results, comparing them with visualizations, experimental measurements and functional requirements of the physical engineering system.

Numerical simulation specialization:

CS2: To adapt, modify and implement software tools for numerical simulation.

WILL YOU BE USING A VIRTUAL PLATFORM? Yes. Google Groups / Google Sites

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WILL YOU BE USING ANY SPECIFIC SOFTWARE? Yes. Linux OS. Gnu compilers and tools: gcc, g++, gnumake. An IDE of development for C++, preferably KDEVELOP or NETBEANS for C++

CRITERIA FOR THE 1ST ASSESSMENT OPPORTUNITY

The students will be evaluated by a number of compulsory practical essays.

There will be practical essays each week and at the end of the course the students will carry out a a final practice involving all the OOP concepts studied in the subject.

CRITERIA FOR THE 2ND ASSESSMENT OPPORTUNITY

The same ones as for the 1ˢᵗ assessment opportunity.

COMMENTS

It is recommended that the student knows basic programming.