# Programming

**Academic Year: ( 2020 / 2021 )** **Review date: 08-07-2020**

**Department assigned to the subject: Computer Science and Engineering Department**

**Coordinating teacher: ZARRAONANDIA AYO, TELMO AGUSTIN**

**Type: Basic Core ECTS Credits : 6.0**

**Year : 1 Semester : 1**

**Branch of knowledge: Engineering and Architecture**

## OBJECTIVES

By the end of this subject, students will be able to have:
1. Knowledge and understanding of the programming foundations and computer systems underlying their branch of engineering.
2. Awareness of the wider multidisciplinary context of engineering.
3. The ability to apply their knowledge and understanding to identify, formulate and solve engineering problems using computer methods.
4. The ability to combine theory and practice to solve engineering problems using computer methods.

## DESCRIPTION OF CONTENTS: PROGRAMME

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The purpose of the course is to give students an overview on programming techniques. As programming language, it will be used a imperative programming language. Precisely, Python is the language used during the course.

PROGRAMME:

1. Programming foundations
Description:
This chapter introduces the essential components of computer programming and programming languages.
Detailed contents:
- Basic architecture of computers
- Computer programming
- Programming paradigms
- Types of programming languages

2. Design of programs
Description:
This chapter focuses on the internal design of programs, paying special attention to the concept of algorithm.
Detailed contents:
- Computer algorithms
- Analysis of algorithms
- Data structures

3. Coding
Description:
Acquiring knowledge on coding by using an imperative programming language.
Detailed contents:
- Program data
- Operators
- Advanced data structures
- Program statements
- Subprograms

4. Testing and debugging
Description:
Learning principles and techniques about testing, debugging and deploying computer programs.

Detailed contents:
- Compilation-execution cycle
- Testing techniques
- Debugging techniques

## LEARNING ACTIVITIES AND METHODOLOGY

- Theoretical lectures: 1,5 ECTS
Lectures oriented to present the theoretical concepts on programming.
- Practical lectures: 1,5 ECTS
Classes in computer labs oriented to learn the use of an IDE and put into practice the syntax.
- Programming exercises: 2,0 ECTS
Problem-based learning. Programming different pieces of code with the purpose of understanding those conceptual, technical, and methodological principles that underlie structured programming.
- Individual study: 1,0 ECTS
Self-studying to prepare for partials and final exams

## ASSESSMENT SYSTEM

- Midterm exam on programming foundations:10%
- Practice: 40%
- Midterm programming exams: 20%
- Final exam: 30%
There is a minimum mark required on the final exam of 5.0 of 10

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| **% end-of-term-examination:** | 30 |
| **% of continuous assessment (assigments, laboratory, practicals…):** | 70 |

## BASIC BIBLIOGRAPHY

- Stephenson, Ben  The Python Workbook, Springer, 2014

## ADDITIONAL BIBLIOGRAPHY

- George W. Gorsline. Computer Organization: Hardware Software., PRENTICE HALL INTERNATIONAL EDITIONS..

- Stephen D.Burd. System Architecture. Hardware and Software in Business Information Systems., BOYD AND FRASER PUBLISHINGCOMPANY..