Programming

Academic Year: (2021 / 2022)   **Review date: 28/06/2021 17:57:14**

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

The objective of this course is to introduce basic programming techniques.
The programming language used during the course is MATLAB. The techniques covered in the course are generic,
and students will be able to make use of them for programming in other languages.

During the course students will acquire knowledge on:
- Fundamentals of the imperative programming
- Fundamentals of structured programming
- Language data types
- Matlab computing language syntax
- Program testing and debugging

Related to specific skills, students will be able to:
- Analyze and understand MATLAB programs
- Localize and fix syntax and functional errors
- Design and develop simple algorithms based on given prerequisites
- Develop simple Matlab programs from functional descriptions
- Design, develop and execute program test plans

DESCRIPTION OF CONTENTS: PROGRAMME

1. Introduction
- Computer architecture
- Programming languages
- Program compilation and execution

2. Programming fundamentals
- Programming paradigms
- Program elements: data and algorithms
- Basic programming tools: algorithms, flow diagrams and pseudocode

3. Programming using MATLAB
- Matlab language characteristics
- Working with matrices
- Expressions
- Operators

4. Flow Control Statements
- Decision-Making Statements
- Looping Statements

5. Scripts and Funcions
- Functions
- Scripts

6. Data Structures
- Characters and Text
- Multidimensional Arrays
- Cell Arrays
- Structures

7. Input / Output Files
- Import / Export data
- ASCII and Binary Files

8. Advanced Techniques
- Debug, testing and error control
- Recursivity

LEARNING ACTIVITIES AND METHODOLOGY

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THEORETICAL-PRACTICAL CLASSES. [44 hours with 100% classroom instruction, 1.67 ECTS]
Knowledge and concepts students must acquire. Student receive course notes and will have basic reference texts to facilitate following the classes and carrying out follow up work. Students partake in exercises to resolve practical problems and participate in workshops and evaluation tests, all geared towards acquiring the necessary capabilities.

TUTORING SESSIONS. [4 hours of tutoring with 100% on-site attendance, 0.15 ECTS]
Individualized attendance (individual tutoring) or in-group (group tutoring) for students with a teacher.

STUDENT INDIVIDUAL WORK OR GROUP WORK [98 hours with 0 % on-site, 3.72 ECTS]

WORKSHOPS AND LABORATORY SESSIONS [8 hours with 100% on site, 0.3 ECTS]

FINAL EXAM. [4 hours with 100% on site, 0.15 ECTS]
Global assessment of knowledge, skills and capacities acquired throughout the course.

METHODOLOGIES

THEORY CLASS. Classroom presentations by the teacher with IT and audiovisual support in which the subject's main concepts are developed, while providing material and bibliography to complement student learning.

PRACTICAL CLASS. Resolution of practical cases and problem, posed by the teacher, and carried out individually or in a group.

TUTORING SESSIONS. Individualized attendance (individual tutoring sessions) or in-group (group tutoring sessions) for students with a teacher as tutor.

LABORATORY PRACTICAL SESSIONS. Applied/experimental learning/teaching in workshops and laboratories under the tutor's supervision.

ASSESSMENT SYSTEM

% end-of-term-examination/test:	40
% of continuous assessment (assigments, laboratory, practicals…):	60

SE1 - FINAL EXAM. [40 %]
Global assessment of knowledge, skills and capacities acquired throughout the course.

SE2 - CONTINUOUS EVALUATION. [60 %]
Assesses papers, projects, class presentations, debates, exercises, internships and workshops throughout the course.

BASIC BIBLIOGRAPHY

- MathWorks Getting Started with MATLAB, MATLAB.

ADDITIONAL BIBLIOGRAPHY

- García de Sola, Juan Francisco Informática Básica, Alhambra Longman.

- Ureña López, L. Alfonso Fundamentos de informática, RA-MA, 1997

BASIC ELECTRONIC RESOURCES

- Mathworks . MATLAB R2018a Documentation: https://es.mathworks.com/help/matlab/getting-started-with-matlab.html