1. BASIC INFORMATION

Course	Fundamentals of computer science for engineering
Degree program	Bachelor's Degree in Industrial Systems Engineering
School	School of Architecture, Engineering, Science and Computing
Year	1
ECTS	6
Credit type	Basic
Language(s)	English
Delivery mode	Face to face
Semester	1
Academic year	25-26
Coordinating professor	Ramiro Diez

2. PRESENTATION

This subject is a basic subject in the Bachelor's Degree in Industrial Systems Engineering at Universidad Europea de Madrid. Its purpose is to provide students with a solid initial training in the use and programming of computers, covering essential topics such as the operation of operating systems, database management, and the handling of computer programs with direct applications in the field of engineering. Throughout the course, students will acquire a comprehensive understanding of the computing environment, learn how to encode information, design programs using high-level programming languages, and work with specialized tools for scientific computing, such as Matlab.

3. LEARNING OUTCOMES

Knowledge

KNO2: Basic knowledge about the use and programming of computers, operating systems, databases and computer programs with application in engineering.

- Identify the general structure of a computer and how it works
- List the functions of an operating system
- Interpret the representation of information on a computer
- Know the basics of a relational database

Skills

SK16: Ability to use and program computers, operating systems, databases and computer programs with application in engineering.

- Design algorithms and code them into a programming language
- Programming Simple Computer Applications Using Procedural Programming
- Solve basic technical problems by using software used in the field of engineering

Competences

CP11: Use information and communication technologies for data research and analysis, research, communication and learning.

4. CONTENT

- Introduction to computer science. The general structure of a computer. Introduction to operating systems.
- Representation of information
- Introduction to programming. Algorithms
- Introduction to a programming language. Types of data. Expressions and operators. Program flow control structures. Vectors.
- Introduction to relational databases and data definition and manipulation languages
- Applications of computer science to engineering

5. TEACHING-LEARNING METHODOLOGIES

The types of teaching-learning methodologies used are indicated below:

- Master class
- Problem based learning
- Simulation environments

6. LEARNING ACTIVITIES

Listed below are the types of learning activities and the number of hours the student will spend on each one:

Campus-based mode:

Learning activity	Number of hours
Master classes	10
Practical seminars	30
Problem solving	40
Autonomous study	60
Debates and panel discussions	5
Face-to-face assessment test	5
TOTAL	**150**

7. ASSESSMENT

Listed below are the assessment systems used and the weight each one carries towards the final course grade:

Campus-based mode:

Assessment system	Weight min. %	Weight max. %

Face-to-face assessment test	50	70
Case/problem	20	50
Performance evaluation	5	5

When you access the course on the *Campus Virtual*, you'll find a description of the assessment activities you have to complete, as well as the delivery deadline and assessment procedure for each one.

8. SCHEDULE

This table shows the delivery deadline for each assessable activity in the course:

Campus-based mode:

Assessable activities	Deadline
Exercises and activities units 1-5	Weeks 3-11
Final knowledge test	Week 12
Matlab practices	Weeks 13-17
Matlab final practice	Week 15, 16 or 17

This schedule may be subject to changes for logistical reasons relating to the activities. The student will be notified of any change as and when appropriate.

9. BIBLIOGRAPHY

The recommended Bibliography is:

- Prieto, A. Lloris, J.C. Torres, Introducción a la Informática, McGraw-Hill
- Luis Joyanes Aguilar. Fundamentos de programación. McGraw-Hill
- Manuel Torres Portero. Microprocesadores y Microcontroladores aplicados a la industria. Paraninfo
- Williams Stallings. Organización y Arquitectura de Computadores. Prentice-Hall.
- Williams Stallings. Sistemas Operativos. Prentice-Hall
- H.M. Deitel. Cómo Programar en C/C++. Prentice-Hall.
- Matlab: Edición del estudiante. Prentice-Hall

10. EDUCATIONAL GUIDANCE, DIVERSITY AND INCLUSION UNIT

From the Educational Guidance, Diversity and Inclusion Unit we offer support to our students throughout their university life to help them reach their academic achievements. Other main actions are the students inclusions with specific educational needs, universal accessibility on the different campuses of the university and equal opportunities.

From this unit we offer to our students:

1. Accompaniment and follow-up by means of counselling and personalized plans for students who need to improve their academic performance.
2. In terms of attention to diversity, non-significant curricular adjustments are made in terms of methodology and assessment for those students with specific educational needs, pursuing an equal opportunities for all students.
3. We offer students different extracurricular resources to develop different competences that will encourage their personal and professional development.
4. Vocational guidance through the provision of tools and counselling to students with vocational doubts or who believe they have made a mistake in their choice of degree.

Students in need of educational support can write to us at:

orientacioneducativa@universidadeuropea.es

11. ONLINE SURVEYS

Your opinion matters!

The Universidad Europea encourages you to participate in several surveys which help identify the strengths and areas we need to improve regarding professors, degree programs and the teaching-learning process.

The surveys will be made available in the “surveys” section in virtual campus or via e-mail.

Your assessment is necessary for us to improve.

Thank you very much for your participation.