1. BASIC INFORMATION

Course	Fundamentals of Programming
Degree Program	Bachelor`s Degree in Computer Engineering
School	Escuela Politécnica
Year	1ª
Credits (ECTS)	6 ECTS
Credit type	Basic
Language(s)	English / Spanish
Delivery mode	On campus
Semester	S1
Academic year	2025-2026
Coordinating professor	

2. PRESENTATION OF THE COURSE

This course aims to establish the foundational knowledge required for students to effectively engage with environments involving programmable interfaces. It introduces algorithmic thinking as a transversal tool that facilitates adaptation to various programming languages and paradigms, with particular emphasis on Object-Oriented Programming, which will be explored in greater depth in subsequent courses. The methodological principles and best practices addressed throughout the course are essential for building a solid base that supports the progressive acquisition of programming competencies.

Through the use of abstraction, algorithm design, and modularity, students will be equipped to develop increasingly complex programs. Programming proficiency is achieved through continuous practice and consultation of technical reference materials; therefore, the course content is oriented towards the direct application of acquired knowledge. Guided experimentation and adherence to best practices will enable students to reach a competent level in the development of software solutions, reinforced by the activities proposed throughout the course.

The acquisition of appropriate programming habits and the ability to solve problems through code implementation will be key competencies applicable across a wide range of subjects within the curriculum. Consequently, Fundamentals of Programming is positioned as a core course within the Bachelor's Degree in Computer Engineering, providing the intellectual and technical tools necessary for academic and professional development in this field.

3. LEARNING OUTCOMES

Knowledge:

KNO02. Know the use and programming of computers, operating systems, databases and software with engineering applications.

KNO03.To know the structure, organization, operation and interconnection of computer systems, the fundamentals of their programming.

Skills:

SK03. Apply the knowledge of the structure, organization, operation, and interconnection of computer systems, and the fundamentals of their programming to solve engineering problems.

Competences:

CMP08. Develop computer applications and systems, ensuring their reliability, security and quality, in accordance with ethical principles and current legislation and regulations.

4. CONTENTS

The contents of the course/module are listed below:

- Elementary program design. Data types, variables and constants.
- I/O (console and files)
- Flow control structures.
- Functions.
- Arrays, matrices and strings.
- Introduction to object-oriented programming.

5. TEACHING-LEARNING METHODOLOGIES

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

- Lectures/ web conferencing
- Problem-based learning
- Project-based learning

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
Lectures	10
Practical seminars	20
Problem-solving	18
Workshops and/or laboratory work	24
Independent working	56
Debates and discussions	8
Tutorials	12

On campus knowledge assessment tests	2
TOTAL	**150**

7. CONTINOUS ASSESSMENT

Each assessable learning activity represents an opportunity for the student to make progress, receive feedback, and consolidate knowledge, skills, and competences. The Learning Outcomes outlined in this guide provide direction for this process and serve as benchmarks for their achievement.

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

Campus-based mode:

Assessment Systems	Weight (%)
On campus knowledge assessment tests	40-60%
Case/problem	5-15%
Performance assessment	0-15%
Workshops/lab work journal	15-50%

In the Virtual Campus, when you access the corresponding course/module you will find information regarding the evaluation systems, including the due dates and the procedures applicable to each of them.

7.1. First exam period

In order to pass the course/module in the ordinary call, the student must obtain a grade greater than or equal to 5.0 (out of 10), in all the evaluation systems proposed in this guide. The final grade will be calculated from the weighted average of all the evaluation systems described.

If in any of the evaluation systems proposed in this guide, a grade lower than 5.0 (out of 10) is obtained, the final grade of the course/module will be “fail” even if, in the result of the weighted average, a value higher than 5.0 (out of 10) is obtained. In the latter case, the course/module would still be “failed” obtaining a final grade of 4.0 (out of 10).

Delivery of activities

Compliance with deadlines is essential to ensure the fairness and planning of the training process.

In case of not submitting an evaluable formative activity in due time and form, and without prior justification, it will not be evaluated and, therefore, will be recorded as “not submitted”.

The student is encouraged to communicate with sufficient time in advance to the teacher of the course/module, any difficulty that may affect their participation in any activity.

Attendance

Active participation in the training sessions is a key component of learning. In order to pass the course/module, at least 50% attendance is required. If this minimum percentage is not reached, the teacher

may consider the course/module as "failed", according to the evaluation regulations of the Universidad Europea de Andalucía.

7.2. Second exam period

The extraordinary exam offers a new opportunity for students to demonstrate their learning. To pass it, it will be necessary to obtain a final grade (weighted average) equal to or higher than 5.0 (out of 10.0).

Delivery of activities

The student must submit and pass those mandatory training activities not delivered or not passed in the ordinary call, respecting the new deadlines established. In case of failure to comply with these new deadlines, the activity will not be evaluated and, therefore, will be recorded as "not presented".

8. SCHEDULE

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

Evaluable training activities	Date
Activities Unit 1 (individual)	Week 3
Activities Unit 2 (individual)	Week 6
Activities Unit 3 (individual)	Week 9
Activities Unit 4 (individual)	Week 12
Activities Unit 5 (individual)	Week 13
Activities Unit 5 (teams)	Week 15
Assessment	Week 16

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. REFERENCES

The reference material for the subject area is as follows:

- Stroustrup, Bjarne (2024). "Programming: Principles and Practice Using C++" 3rd ed. Pearson.
- Stroustrup, Bjarne (2022). "A Tour of C++" 3rd ed. Pearson.

10. AREA OF GUIDANCE, DIVERSITY AND INCLUSION

The Area of Guidance, Diversity and Inclusion (ODI) offers support to students throughout their university career, with the aim of facilitating their academic and personal development and supporting them in achieving their goals. This Area focuses its work on three Core pillars: the inclusion of students with specific educational support needs, the promotion of universal accessibility in the educational community and the guarantee of equal opportunities for all.

Among the services offered are:

- **Academic accompaniment and monitoring**, through counselling and the development of personalised plans aimed at those who need to improve their academic performance.
- **Attention to diversity**, through the implementation of non-significant curricular adjustments - in methodological and Assessment aspects - for students with specific educational support needs, in order to guarantee equal opportunities.
- **Extracurricular training resources**, aimed at developing personal and professional Competencies that contribute to the integral growth of students.
- **Vocational guidance**, through the provision of tools and advice to those who have concerns about their choice of Degree or are considering a change in their educational path.

Students in need of educational support can contact the Area via the following email address: orientacioneducativa@universidadeuropea.es

11. ONLINE SURVEYS

Participating in the Satisfaction Surveys is an enriching opportunity to contribute to the continuous improvement of the Degree as well as the institution. Thanks to them, it is possible to identify which aspects of academics, teaching staff and the teaching-learning process are working well and which can be further improved.

With the aim of encouraging active participation in the completion of surveys among students, various channels of dissemination have been set up. The surveys are available in the space provided on the Virtual Campus and are also sent by email to facilitate access.

The responses collected allow decisions to be made that have a direct impact on the quality of the learning experience and on the day-to-day life of the university community.