1. BASIC INFORMATION

Course	Fundamentals of Programming II
Degree program	Degree in Business Analytics
School	Faculty of Social Sciences and Communication
Year	2nd
ECTS	6
Credit type	Compulsory
Language(s)	English / Spanish
Delivery mode	Face-to-face
Semester	3rd
Academic year	2025-2026
Coordinating professor	Dr. Manuel Garcia Fernandez

2. PRESENTATION

The course aims to build upon the foundations so that students can approach the learning of environments involving programmable interfaces. This is the second course in the Programming Fundamentals subject area. The competencies and learning outcomes described in the degree syllabus are associated with this subject area, and will therefore be achieved upon completion of this second course.
The goal is to reinforce previously acquired knowledge in order to focus in depth on the following elements:

- Design and Implementation of Classes
- Attributes, constructors, methods
- Inheritance
- Advanced class design: method overloading and overriding
- Abstract classes, polymorphism, interfaces
- Interpretation of UML designs
- Quality assurance and design patterns
- User interface

Emphasis will also be placed on the application of good programming practices, with the aim of enabling students to write clean and well-structured code.

3. LEARNING OUTCOMES

Basic Competencies:

- **CB1:** Students must demonstrate that they possess and understand knowledge in a field of study that builds upon general secondary education, and is typically found at a level that, while

supported by advanced textbooks, also includes aspects involving knowledge from the forefront of their field of study.

- **CB2:** Students must be able to apply their knowledge to their work or vocation in a professional manner and possess the competencies typically demonstrated through the development and defense of arguments and the resolution of problems within their area of study.

Specific Competencies:

- **CE22:** Ability to select and apply the most appropriate analytical tools for each company situation.
- **CE31:** Ability to manage uncertainty due to the constant change in information sources.

Learning Outcomes:

- **RA1:** Develop algorithmic thinking. Translate a problem into a sequence of actions that solve it.
- **RA2:** Design and implement solutions for moderately difficult problems, including the use of databases, data structures, and object-oriented programming.
- **RA3:** Use programming environments to compile, link, and execute programs, as well as identify and correct errors at each stage.
- **RA4:** Appreciate good documentation of the designs produced, as well as the inclusion of comments in the code to facilitate interpretation and reuse of the developed software.
- **RA5:** Participate in group work, arguing one's position, listening actively and positively, and empathizing with the positions of peers.

The table below shows the relationship between the competencies developed in the course and the intended learning outcomes:

Competencies	Learning Outcomes
CB1, CE22, CE31	RA1, RA2, RA3
CB2, CE22, CE31	RA4, RA5

4. CONTENT

Subject is organized on the following units:

- Unit 1: Fundamentals of Python Review.
- Unit 2: Introduction to Object Oriented Programming (OOP).
- Unit 3: Class Relationship and Introduction to Unified Modelling Language (UML).
- Unit 4: Advanced Object Oriented implementation in Python. Quality Assurance and Unit testing.
- Unit 5: REST application development in Python.

5. TEACHING-LEARNING METHODOLOGIES

The following teaching and learning methodologies will be applied:

- Lecture / Web Conference
- Case Method
- Workshop-based and 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
Tutorship	10
Masterclasses	30
Case Studies	30
Report writing	10
Autonomous work	38
Laboratories	33
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
Written Exams	40%
Group Assignment (Oral Exposition & Final Assignment)	30%
Individual Assignments (Labs & Problem Solving)	30%

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.

7.1. First exam period

To pass the course in the first exam period, you must obtain a final course grade of at least 5 out of 10 (weighted average).

In any case, you will need to obtain a grade of 5.0 in the final exam and a minimum of 5.0 must also be obtained at the Group Assignment.

7.2. Second exam period

To pass the course in the first exam period, you must obtain a final course grade of at least 5 out of 10 (weighted average).

In any case, you will need to obtain a grade of 5.0 in the final exam and a minimum of 5.0 must also be obtained at the Group Assignment.

The student must deliver the activities not successfully completed in the first exam period after having received the corresponding corrections from the professor, or those that were not delivered in the first place.

8. SCHEDULE

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

Assessable activities	Deadline
Individual Assignment 1	End of unit 1
Individual Assignment 2	End of unit 2
Individual Assignment 3	End of unit 3
Individual Assignment 4	End of unit 4
Individual Assignment 5	End of unit 5
Group Assignment	End of Semester
Final Exam	Endo f Semester

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

9. BIBLIOGRAPHY

The main reference work for this subject is:

Basic:

- L. Ramalho, “Fluent Python”, Ed. O’Reilly
- M. Priestley, “Practical Object-Oriented Design with UML”, Ed. McGrawHill

- Yue Zhang, “An introduction to Python and Computer Programming” 1st ed. 2015. Springer

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 mean 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 opportunity 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 on virtual campus or via e-mail.

Your assessment is necessary for us to improve.

Thank you very much for your participation.