1. BASIC INFORMATION

Subject	Fundamentals of Programming I
Degree program	Bachelor's Degree in Business Analytics
School	Social Sciences and Communication
Year	1st
ECTS	6 ECTS
Credit type	Compulsory
Language	English
Delivery mode	On campus
Semester	First semester
Academic year	2025-26
Coordinating professor	José Antonio Lozano
Professor	Miguel Ordoñez Rengel

2. PRESENTATION

The subject area aims to lay the foundations so that students can face learning environments involving programmable interfaces. Being the introductory subject area, it will also include prior content with the aim of providing a general framework of the foundations of computering. In addition, the subject area will provide an introduction to algorithmic thinking, so that it can be adapted to any programming environment. Also, emphasis will be put on the neat programming style, so that, going forward, the students will be able to generate codes in a clean and structured way.

Throughout the course, the following topics will be covered:

- Data types, operators, and variables
- Control structures: conditionals and loops
- Data structures: tuples, lists, and dictionaries
- Data input and output
- Error handling and management

This is the first subject area within the Fundamentals of Programming subject, and is followed by Fundamentals of Programming II. The skills and learning outcomes outlined in the degree program description are associated with the subject and will be achieved at the end of the second subject area.

3. COMPETENCIES AND LEARNING OUTCOMES

Basic skills:

- CB1: Students have shown their knowledge and understanding of a study area originating from general secondary school education, and are usually at the level where, with the support of more advanced textbooks, they may also demonstrate awareness of the latest developments in their field of study.
- CB2: Students know how to apply their knowledge to their work or vocation professionally and have the skills that are usually demonstrated by forming and defending opinions and solving problems within their study area.

Specific skills :

- CE22 - Ability to select and apply the most appropriate analytical tools to each situation of the company.
- CE31 - Ability to manage uncertainty due to constantly changing information sources

Learning outcomes :

- RA 1. Develop algorithmic thinking. Transform a problem into a sequence of actions that can be taken in order to solve the problem.
- RA 2. Design and implement solutions to solve problems of medium difficulty including the use of databases, data structures and object orientation.
- RA 3. Use programming environments for compiling, linking and executing programs, as well as identifying and correcting errors at each stage.
- RA 4. Evaluate good documentation of the designs made, as well as the introduction of comments in the code to facilitate the interpretation and reuse of the software made.
- RA 5. Participate in group work, arguing your stance, actively and positively listening to and empathising with the opinions of peers.

The following table shows how the skills developed in the subject area relate to the intended learning outcomes:

Competencies	Learning outcomes
CB1, CE22, CE31	RA 1, RA 2, RA 3
CB2, CE22, CE31	RA 4, RA 5

4. CONTENT

The subject is organised into seven topics:

- Topic 1 Introduction to computing
- Topic 2. Structure of a program
- Topic 3. Control statements
- Topic 4. Data structures
- Topic 5. Functions
- Topic 6. Data input and output

Each of these topics share the following objectives by adding the new programming elements indicated in the topic name. These objectives are:

- Develop algorithmic thinking by translating a problem into the sequence of steps that are needed to solve it.
- Use the Python programming language to create programs that solve problems of low and medium complexity.
- Use a programming environment to generate software.

5. TEACHING-LEARNING METHODOLOGIES

The types of teaching-learning methods are as follows:

- Lecture / Web conference
- Case studies
- Workshop-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:

Learning activity	Number of hours
Tutorials	10
Lectures	30
Case studies	30
Writing reports and papers	10
Independent working	37
Workshops and/or laboratory work	33
TOTAL	**150 h**

7. ASSESSMENT

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

Assessable task	Assessment criteria	Weighting (%)
Individual Exercises	• Completeness and correctness • Code documentation • On-time submission	20
Group Project	• Fulfillment of the required functionality • Quality of documentation • Team performance • Presentation and documentation	20
Exams	• Accuracy of answers • Code clarity and cleanliness	50
Class Behavior and Participation		10

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

In order to pass the course in the ordinary exam, you must obtain a grade higher or equal to 5.0 out of 10.0 in the final grade (weighted average) of the course.

In any case, it will be necessary that you obtain a grade higher or equal to 5.0 in the presential tests and in the case/problem, so that it can be averaged with the rest of the activities.

7.2. Second exam period

In order to pass the course in the ordinary exam, you must obtain a grade higher or equal to 5.0 out of 10.0 in the final grade (weighted average) of the course.

In any case, it will be necessary that you obtain a grade higher or equal to 5.0 in the presential tests and in the case/problem, so that it can be averaged with the rest of the activities.

The activities that were not passed in the ordinary exam must be handed in, after having received the corresponding corrections from the teacher, or those that were not handed in.

8. SCHEDULE

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

Assessable activities	Deadline
Class exercise. Algorithms	Week 1-2
Classroom exercise. Sequence	Week 3
Classroom exercise. Selection. Class exercise. Loops	Week 4-6
Written test. Partial 1 Activity. Partial 1 Preparation Activity. Partial Solution 1	Week 7
Classroom exercise. Data structures	Week 8 - 9
Class exercise. Functions	Week 10-11
Classroom exercise. Functions	Week 12-13
Written test. Partial 2 Activity. Partial 2 Preparation Activity. Partial Solution 2	Week 14
Project.	Week 15-16
Project. Presentation. Final exam.	Week 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 following is a recommended bibliography:

- Yue Zhang, "An introduction to Python and Computer Programming" 1st ed. 2015. Springer
- Rosalia Pena, "Problem solving for engineers with structured Python". Madrid (2016). Ibergarceta Publicaciones, S.L.
- Martelli,Alex, "Python: reference guide", (2008), Anaya Multimedia.
- Shaw, Zed A.., "Learn to program with PYTHON 3", (2017), Anaya Mulitmedia.

10. EDUCATIONAL GUIDANCE AND DIVERSITY UNIT

From the Educational Guidance and Diversity 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.