

Programming

Code: 106932
ECTS Credits: 6

Degree	Type	Year	Semester
2503743 Management of Smart and Sustainable Cities	FB	1	2

Contact

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Teaching groups languages

You can check it through this [link](#). To consult the language you will need to enter the CODE of the subject. Please note that this information is provisional until 30 November 2023.

Teachers

Raimon Casanova Mohr

Carlos Casado Martinez

Prerequisites

Basic computer skills.

Objectives and Contextualisation

In this area, the basic concepts related to Information Technology and Communications (ICT) as tools for the development of city management applications will be introduced, as well as basic notions of algorithmics and application programming.

Learning Outcomes

1. SM07 (Skill) Solve simple problems for the management of cities by means of computer applications that process and extract information from geospatial data.
2. SM08 (Skill) Use algorithm and programme analysis techniques to design new algorithmic solutions based on the idea of recursion or specific algorithm design techniques.

Content

1. Introduction to programming
 - Variables and data types
 - Arithmetic and logical operators
 - Precedence of operators
2. Control structures.
 - Conditionals (if/else, switch/case)
 - Loops (while, for, do while)
3. Functions and actions/procedures
4. Structured data types
 - Arrays
 - Objects/tuples
5. Algorithmic schemes (search and path)

Methodology

The teaching methodology will be based on three types of activities:

- Guided activity: theoretical classes, laboratory, and exercise analysis.
- Supervised activity: attendance to tutorials and completion of exercises with scheduled follow-up.
- Autonomous activity: part of student study and case resolution, individually or in groups.

In order to be able to perform a correct assessment of the transversal competencies corresponding to the subject, the students will be proposed to carry out joint work. This activity will allow them to develop the transversal competencies related to group work (T01), becoming responsible for the tasks assigned, respecting the role of the different members of the team, and evaluating critically the work carried out (T05) among them.

The preferred form of communication with students will be the virtual campus combined with the institutional mail of the UAB.

Annotation: Within the schedule set by the center or degree program, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

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Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Autonomous work	76	3.04	SM07, SM08, SM07
Exercises and laboratories	24	0.96	SM07, SM08, SM07
Theory classes	26	1.04	SM07, SM08, SM07

Assessment

1. Evidence of continuous evaluation

There are two tests that include the five blocks of matter (1,2 in the first test and 3,4,5 in the second test).

Continuous evaluation tests	Weight note continuous assessment	Minimum mark to make an average
1-2 Introduction programming, control structures.	50%	3,5
3-5 Functions and procedures, data structures, algorithmic schemas.	50%	3,5

2. Final evaluation mark

Final mark	Weight final mark
Continuous evaluation	60%
Class Picks	10%
Laboratory	30%

3. It is considered approved by anyone:

- have a final mark equal to or greater than 5 and
- have approved the laboratory activities (minimum 5) i
- there is no evidence of continuous evaluation below the minimum mark (4.0) to do the average.

4. Assessment of practices

There will be a total of 5 laboratory activities where the algorithm will be asked to bring home prepared for each one of them, which will count 10% of the laboratory activities mark.

5. Class picks cannot be retrieved.

6. There will be a final exam of the two blocks of theory aimed at recovering the not surpassed part of the continuous evaluation.

7. At the beginning of the academic year, if possible, it will be notified if there is a validation of laboratory activities. In the case of being, the validation of laboratory activities only will realize to the students who request it and have approved the laboratory activities in the previous course. The weight of the continuous evaluation in the final mark, in the students with the validation of laboratory activities, becomes 90%.

8. Continuous evaluation dates are set at the beginning of the course and do not have alternative recovery dates in case of non-attendance. If there is any change in programming due to the adaptation to possible incidents, the virtual campus will always be informed about these changes.

9. Notwithstanding other disciplinary measures deemed appropriate, and in accordance with the current academic regulations, irregularities committed by a student that can lead to a variation of the qualification will be classified as zero (0). For example, plagiarizing, copying, copying, ..., an evaluation activity, will imply

suspending this evaluation activity with zero (0). Assessment activities qualified in this way and by this procedure will not be recoverable. If it is necessary to pass any of these assessment activities to pass the subject, this subject will be suspended directly, without an opportunity to recover it in the same course.

10. Non-evaluable cases

In case no delivery is made, it will not be included in any laboratory session and no exam will be carried out, the corresponding grade will be "not evaluable". In any other case, "not presented" counts as a 0 for calculating the weighted average, which will be a maximum of 4.5. Then, participation in an activity evaluated implies that "not presented" in other activities such as zeros are taken into account. For example, an absence in a laboratory session involves a note for that activity.

11. Pass de course with honors

To pass the course with honors will be awarded to those who obtain a mark greater than or equal to 9.5 in each part, up to 5% of those enrolled in descending order of final grade. At the discretion of the teaching staff, they may also be granted in other cases.

12. Examination by a single assessment

Single assessment is not foreseen

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Evaluation tests	60%	4	0.16	SM07, SM08
Laboratory activities	30%	10	0.4	SM08
Supervised activities	10%	10	0.4	SM07, SM08

Bibliography

- A. Prieto, A. B. Prieto. Conceptos de informática. Ed. Mc Graw Hill, 2005.
- Mark Lutz. Learning Python, Fourth Edition. Ed. O'Reilly Media, Inc., 2009.

Software

Python IDLE