Degree	Type	Year	Semester
2500001 Management of Smart and Sustainable Cities	OB	3	1

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.

Prerequisites

Basic knowledge of information systems (Operating Systems, Networks, Services, ...) as well as its basic management and administration.

Objectives and Contextualisation

Develop skills and abilities in distributed computing systems for data processing in urban environments and in cloud computing services as computer infrastructure and data storage.

Competences

- Demonstrate creativity, initiative and sensitivity in the different social and environmental topic areas.
- Identify and use different sources, models and data bases of information generated by urban activity, as well as their principles of operation, access policies and standards.
- Measure the technological infrastructure necessary to respond to the needs of cities, understanding the interactions between technological, social and operational aspects of cities.
- Solve urban management problems using knowledge, methodology and procedures for the design and implementation of computer applications for different types of environment (web, mobile, cloud) and different paradigms.
- Students must be capable of applying their knowledge to their work or vocation in a professional way and they should have building arguments and problem resolution skills within their area of study.
- Students must be capable of collecting and interpreting relevant data (usually within their area of study) in order to make statements that reflect social, scientific or ethical relevant issues.
- Students must be capable of communicating information, ideas, problems and solutions to both specialised and non-specialised audiences.

- Work cooperatively in complex and uncertain environments and with limited resources in a multidisciplinary context, assuming and respecting the role of the different members of the group.

Learning Outcomes

1. Apply automated decision-making techniques.
2. Apply the principles of computing-infrastructure management.
3. Demonstrate creativity, initiative and sensitivity in the different social and environmental topic areas.
4. Design interactions with database-management systems to obtain information on urban activity.
5. Size the databases necessary for a specific designed service.
6. Students must be capable of applying their knowledge to their work or vocation in a professional way and they should have building arguments and problem resolution skills within their area of study.
7. Students must be capable of collecting and interpreting relevant data (usually within their area of study) in order to make statements that reflect social, scientific or ethical relevant issues.
8. Students must be capable of communicating information, ideas, problems and solutions to both specialised and non-specialised audiences.
9. Work cooperatively in complex and uncertain environments and with limited resources in a multidisciplinary context, assuming and respecting the role of the different members of the group.
10. Write the technical reports pertaining to a database.

Content

1. Introduction to computer systems: basic concepts of computing & OS.

2. Introduction to distributed systems: architecture, models, Internet of Things, errors, security.

3. Cloud Computing: data management of urban activities in the cloud.

4. Study of cases of cloud computing platforms: dynamic architectures, capacity, performance and cost.

5. Models and data analysis tools. Case study of distributed data management using mobile apps.

Methodology

The subject contains three sections where each one will have a methodology appropriate to the type of teaching taught:

Conceptual classroms: The theoretical and conceptual aspects of the contents of the subject.

Applied concepts: collaborative workgroup in the classroom with tutoring of the teacher in each group and in each session. The group will have to develop some subjects assigned by the teacher.

Practices: sessions of groups of 2 students. These students will develop some labs about specific items in the laboratory of the subject.

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

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Applied concepts	11.5	0.46	2, 8, 9
Conceptual classroms	22.1	0.88	8, 6, 7, 10, 9
Labs	11.5	0.46	2, 7
Type: Autonomous			
Personal homework	100	4	2, 1, 3, 5, 4, 9

Assessment

Assessment:

Considering the practical nature of this subject, there is no single assessment option.

a) Assessment activities

The assessment of the student will be based on the evaluation of the different activities of the subject:

- General concepts: individual quiz of general concepts developed in the whole subject.
- Applied concepts: quiz for the evaluation of concepts developed in workgroup.
- Practices: assessment of collaborative work and personal work developed during the sessions (practial assessment).

Important: the activity of Practices are not recoverable, if the grade is lower than 5, the can't pass the subject.

b) Calendar of evaluation activities

The evaluation activities will be continued and the delivery is through the Virtual Campus. The dates of continuous evaluation and work delivery will be published at virtual campus. The student will be informed in the virtual campus about possible changes since this is the information interchange platform between teachers and students.

c) Recovery process

If the student don't pass the individual evaluation of general/applied concepts and with practice grade >= 5 points and that the weighted grade is >= 3.5 points, an additional quiz will be programed. The grades will compute the indicated percentage >= 5 points. Otherwise and after the recover quiz the student don't reach 5 points in each part, the student will not pass the course and as a final grade will have the equivalent weighted grade if <=5 or 4.5 if the calculation of the grade weighted this note is greater >=5.

d) Review of qualifications

For each evaluation activity (except for automatic correction activities), a place, date and time of revision will be fixed. The student can review the activity with the teacher. If the student does not apply for this review, this activity will not be reviewed later.

e) Qualifications

Honor Grade.Honor grade is the decision of the subject staff. The regulations of the UAB indicate that HG can only be granted to students who have obtained a final grade >= 9.00 and only can be assigned up to 5% of HG of the total number of students enrolled. The award of MH is considered a merit and sign of excellence and is reserved for students who meet the requirements and not will be assigned automatically.

In the case of not attending any evaluation the student will have a Not Evaluable as the final grade of the subject.

f) Irregularities by the student, copy and plagiarism

Without prejudice to other disciplinary measures and in accordance with current academic regulations, irregularities committed by a student in an evaluable activity will have a grade = zero (0). These evaluation activities qualified with zero (0) will not be recoverable. If this activity is necessary to pass compulsory evaluation activities, this subject will be qualifed as 'not pass" directly (without the opportunity to recover it in the same course).

These irregularities include, among others:

- the total or partial copy of a work, report, or any other evaluation activity;
- let copy;
- present a group work not done entirely by the members of the group (applied to all members, not only those who have not worked);
- presentas own materials prepared by a third party, even if they are translations or adaptations, and in general works with non original and exclusive elements of the student;
- have communication devices (such as mobile phones, smart watches, camera pens, etc.) accessible during individual evaluation quiz;
- talk with peers during individual quiz;
- copy or attempt to copy from other students during the evaluation quiz;
- use or attempt to use writings related to the subject during the individual quiz.

In future editions of this subject, students with this irregular actions can't compesate activities from previous year. In summary: the copy or plagiarism (or attempting) in any of the evaluation activities is equivalent to don't pass the subject & this action invalidate compensatory activities in subsequent courses.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Applied concepts	20%	0.4	0.02	2, 5, 4, 10
General concepts	48%	4	0.16	8, 6, 7
Labs	32%	0.5	0.02	1, 3, 4, 10, 9

Bibliography

Ebook UAB:(para acceder desde fuera de la UAB utilizar http://xpv.uab.cat) -BR recommended bibliography-

(BR) Big data, data mining, and machine learning : value creation for business leaders and practitioners / Jared Dean	Dean, Jared, autor	Document electrònic
(BR) Encyclopedia of cloud computing / editors, San Murugesan, Irena Bojanova	--	Document electrònic
Fog and edge computing : principles and paradigms / edited by Rajkumar Buyya and Satish Narayana Srirama	--	Document electrònic

Internet of things A to Z : technologies and applications / edited by Qusay F. Hassan	--	Document electrònic
(BR) The internet of things & data analytics handbook / edited by Hwaiyu Geng	--	Document electrònic
Professional Hadoop / Benoy Antony [i cinc més]	Antony, Benoy, autor	Document electrònic
(BR) Cloud Computing. Wiley. 2016. https://onlinelibrary.wiley.com/doi/book/10.1002/9781118821930	San Murugesan, Irena Bojanova.	

Software

Students must use VirtualBox (open source software) from their personal computers and a Browser to connect to the Department's Cloud and execute virtual machines. All the software used in the course is open source software.