

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

Contact

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Teaching groups languages

You can view this information at the [end](#) of this document.

Prerequisites

There are no prerequisites related to this subject, although it will be useful to have computer and statistics skills.

Objectives and Contextualisation

The subject will provide the necessary elements to acquire and understand the cartographic conceptions for the spatial representation of territorial dynamics.

A Smart City aims to provide a high quality of life, consuming the least resources. However, in order to represent urban dynamics and analyze the city, it is essential to acquire and understand the cartographic conceptions for the spatial representation.

Learning Outcomes

1. CM09 (Competence) Relate knowledge and skills in geomatics with those provided by other technicians in interdisciplinary teams.
2. KM14 (Knowledge) Apply cartographic conventions that allow for an appropriate design of maps as a means of transmitting information.
3. SM13 (Skill) Apply sensorisation, data acquisition, processing and communication technologies and systems to the modelling of urban systems.

Content

Theme 1. Introduction to cartography

- Cartographic concepts
- The maps, the reason of the subject

- The Geographic Information systems

Theme 2. Principles of geospatial representation: points, lines and polygons

- What are the layers?
- What is geographic information?
- Data models: vector and raster

Theme 3. Territorial scales and their functions

- The scale concept
- The scale calculation
- The maps according to the scale: large, medium, and small scale

Theme 4. Cartographic projections and their functions

- Geodesy and references systems
- The projection concept
- The UTM projection

Theme 5. Symbolization of information and graphic design

- Visual variables
- The simbolization in points, lines and polygons
- Graphic design: basic principles and cartographic composition

Theme 6. Data sources

- Alphanumeric data sources: world, European, Spanish, Catalan and locals
- Spatial data sources: world, European, Spanish, Catalan and locals

The schedule, with the sequencing of the themes and the assessment activities, will be uploaded to the virtual campus at the beginning of the course.

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Home assignments, activities and self-teaching	43	1.72	CM09, KM14, SM13
Lectures	20	0.8	KM14, SM13
Type: Supervised			
Assignments	25	1	CM09, KM14, SM13

Theoretical knowledge is introduced and reinforced through:

Oral exhibitions

Guided teacher-class practices

The technical and instrumental skills will be developed in:

Guided teacher-class practices
 Small groups practice sequence.
 All the data, tutorials and materials of the subject will be available on the Virtual Campus.

To follow the course students will be provided with a specific GIS software: ArcGis (commercial). In case the lessons have to be online due to an exceptional situation, the specific GIS program that will be used is Qgis.

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.

Assessment

Continous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Autonomous practical work	40	30	1.2	CM09, KM14, SM13
Final work. Cartographic composition and data sources search	20	26	1.04	CM09, KM14
Theory and practical tests	40	6	0.24	CM09, KM14, SM13

Assessment

Items of the evaluation:

- 2 Middle term exams (theoretical-practical) (20% half-semester-20% at the end of semester)
- Practical exercises (40%)
 1. Introduction to cartography. Working with projections (10%)
 2. Introduction to the treatment and consultation of geographic information (10%)
 3. Data source (20%)
- Final work (20%): Elaboration a thematic atlas of Barcelona

Requirements for being assessed

The degree requires to attend a minimum of 80% to be evaluated. Only absences due to illnees or similar reasons ay be justifiable.

Optional tasks

During the course, it will be other optional learning activities to complement the student's education. Delivery of these practices is optional.

Requirements to pass the course

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Two requirments:

to have an average mark of 5/10;
to have a minimum mark of 4/10 in each exam
If the students do not pass the subject, the mark will be the result of the evaluation.

Other aspects

If there is no justified cause, the assessment activities will be at the day and time agreed by the university timetable.

RECOVERY PROCESS

When the ordinary assessment has finished, if the students fail, they can do a recovery exam according to the University dates. If the student wants to do the recovery have to:

deliver at least 80% of the practical work

pass the recovery exam

It will only be possible to reassess the theoretical and practical exam. Failed exercises may only be resit when the average mark does not reach 5. The maximum mark in case of resit is 6.

PROCEDURE FOR REVIEW OF QUALIFICATIONS

For each assessment activity, the coordinator of the subject will indicate place, date and time of the review. In this context, the student can claim about the assessment activity qualification, which will be reviewed by the coordinator of the subject. If the student does not submit to this review, this assessment activity will not be reviewed later.

QUALIFICATIONS

Honors. Granting an Honor is a decision of the coordinator of the subject. The UAB regulations can only be awarded to students having obtained a final grade of at least 9. It can be granted up to 5% of Honors of the total number of students enrolled.

A Student will be considered non-evaluable (NA) when it has not been presented the assessment activities whose weight are two thirds of the total grade of the subject.

PLAGIARISM AND OTHER IRREGULARITIES

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 opportunity to recover it in the same course. These irregularities include, among others:

- the total or partial copy of a lab exercise, report, or any other evaluation activity;
- let another student to copy; present a group work not done entirely by the members of the group (applied to all members and not only to those who have not worked);
- present as own materials prepared by a third party, even if they are translations or adaptations, and
- generally works with non-original and exclusive elements of the student;
- have communication devices (such as mobile phones, smart watches, pens with camera, etc.)
- accessible during theoretical-practical assessment tests (individual exams);
- talk with classmates during the individual theoretical-practice tests (exams);
- copy or attempt to copy from other students during the theoretical-practical assessment tests (exams);
- use or attempt to use written material related to the subject during the theoretical-practical evaluation tests (exams), when these have not been explicitly allowed.

REPEATING STUDENTS

In case of repeating students, the mark of the practices of the previous course cannot be validated. Without prejudice to other disciplinary measures deemed appropriate, and in accordance with the current academic regulations, irregularities committed by a student who may lead to a variation of the qualification in an assessable activity will be graded with zero (0).

Bibliography

CARTOGRAPHY HANDBOOKS

- Barber, P. (2006) El gran libro de los mapas, trad. en castellà. Barcelona: Paidós.
- Dent, B.; Torguson, J. and Hodler, T. (2008) Cartography: Thematic Map Design. 6th edition. Boston: WCB /McGrawHill.
- Joly, F. (1988) La cartografia, trad. en castellà. Vilassar de Mar (Barcelona): OikosTau.
- Rabella, J.M., Panareda, J.M., Ramazzini, G. (2011). Diccionari terminològic de cartografia. Enciclopèdia Catalana i Institut Cartogràfic de Catalunya, Barcelona. 417 p. Consultable a http://www.termcat.cat/ca/Diccionaris_En_Linia/197
- Robinson, A.H.; Morrison, J.L.; Muehrcke, P.C.; Kimerling, A.J. and Guptill, S.C. (1995) Elements of Cartography. 6th edition. New York: John Wiley and Sons

GIS HANDBOOKS

1. Bernhardsen, Tor. Geographic information system: An introduction. Nova York: John Wiley & Sons, 1999. Burrough, P. A. Principles of Geographical Information Systems. Oxford: Oxford University Press, 1998. Comas Vila, David. Fundamentos de los Sistemas de Información Geográfica. Barcelona: Ariel, 1993.
2. Gutierrez Puebla, Javier; GOULD, Michael. *SIG: Sistemas de Información Geográfica*. Madrid: Síntesis, 1994.
3. Nunes, J. (2012). Diccionari terminològic de sistemes d'informació geogràfica. Enciclopèdia Catalana i Institut Cartogràfic de Catalunya, Barcelona. 551 p. Consultable a http://www.termcat.cat/ca/Diccionaris_En_Linia/197
4. Oyala, V. (2011). *Sistemas de Información Geográfica*. Consultable a <http://volaya.github.io/libro-sig>

Software

A specific GIS software is used to complete the course: ArcGis (commercial), MiraMon (free for students) or Qgis (free).

Language list

Name	Group	Language	Semester	Turn
(PAUL) Classroom practices	1	Catalan	first semester	afternoon
(PAUL) Classroom practices	2	Catalan	first semester	afternoon
(PLAB) Practical laboratories	1	Catalan	first semester	afternoon
(PLAB) Practical laboratories	2	Catalan	first semester	afternoon
(TE) Theory	1	Catalan	first semester	afternoon