



Universitat de Lleida

DEGREE CURRICULUM
TOPOGRAPHY AND RESTATED

Coordination: CARRILLO MAHIQUES, GUSTAVO

Academic year 2022-23

Subject's general information

Subject name	TOPOGRAPHY AND RESTATED			
Code	101411			
Semester	1st Q(SEMESTER) CONTINUED EVALUATION			
Typology	Degree	Course	Character	Modality
	Bachelor's Degree in Architectural Technology and Building Construction	3	COMPULSORY	Attendance-based
Course number of credits (ECTS)	6			
Type of activity, credits, and groups	Activity type	PRAULA	TEORIA	
	Number of credits	3	3	
	Number of groups	1	1	
Coordination	CARRILLO MAHIQUES, GUSTAVO			
Department	AGRICULTURAL AND FOREST ENGINEERING			
Teaching load distribution between lectures and independent student work	Each ECTS credit is assigned 25 hours of student work. 10 hours per ECTS are devoted for in-person student work attending the different academic activities and 15 hours per ECTS are devoted to independent student work.			
Important information on data processing	Consult this link for more information.			
Language	Catalan: 90% English: 10%			
Distribution of credits	Theory: 48% Practice in computer room: 40% Practice in the field: 12%			

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
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Subject's extra information

Topography is the science that studies the set of principles and procedures for the graphic representation of the surface of the earth, with its natural and artificial forms and details (planimetry and altimetry). This topography representation takes place on flat surfaces, limited to small tracts of land, using the name Geodesy for larger areas. You will learn how to take these forms and details to reality through the Stakeout. Currently, Topography is based on the management of equipment, technologies and specific software. The use of these technologies has great interest and application in other subjects of the degree.

Finally, it is **COMPULSORY** that the students bring the following elements of individual protection (EPI) to the field practices:

- Reflective vest

This item can be purchased at the shop Údels of the UdL:

C/ Jaume II, 67 baixos
Centre the Cultures i Cooperació Transfronterera

<http://www.publicacions.udl.cat/>

Not bringing the EPI's described imply that the student can not access to the laboratories or have to go out of them. The no realisation of the practices for this reason imply the **consequences in the evaluation** of the subject that are described in this course guide.

For further information, you can check the following document of the *Servei de Prevenció de Riscos Laborals de la UdL*: <http://www.sprl.udl.cat/alumnes/index.html>

Learning objectives

The objectives of the subject Topografia i Replantejaments are the following:

- Present the foundations of topography and digital terrain models, as well as their applications in works and building.
- Present the concepts, methods and technologies for the realization of planimetric and altimetric surveys, setting up, leveling and calculation of surfaces.
- Obtain, process and analyze the information of the territory in order to create and build the elements

designed in the office.

- Unveil Geographic Information Systems which allow for territorial studies.

Competences

EPS-transversal competences

- **EPS8.** Ability to plan and organize personal work.

Degree-specific competences according to ORDEN ECI/3855/2007

- **GEE9.** Ability to interpret and elaborate the graphic documentation of a project, perform data collection, plan surveys and geometric control of work units.
- **GEE10.** Knowledge of infographic and cartographic procedures and methods in the building field.
- **GEE11.** Ability to work with topographic instrumentation and to proceed to the graphic survey of plots and buildings, and their stakeout on the ground.

Subject contents

The content of the course is structured in the following topics:

Theoretical sessions:

- Topic 1: General notions of topography: concepts, units of measurement, errors, representation systems.
- Topic 2: Cartography: the concept of cartography and Geographic Information Systems (GIS).
- Topic 3: Topographic instruments. Surveying and topographic stakeout
- Topic 4: Planimetric and altimetric methods.
- Topic 5: Creation of Digital Terrain Models (DTMs)
- Topic 6: Global Navigation Satellite Systems (GNSS) for Surveying and Stakeout.
- Topic 7: LiDAR in topography.
- Topic 8: Photogrammetry.

Practical sessions:

Practice 1 (Computer Classroom): Working with digital cartography: overlaying and geo-referencing of images. Presentation of digital cartographic platforms as a source of information.

Practice 2 (Computer Classroom): Digital terrain model (DTM). Design and calculation of a simple road (first part).

Practice 3 (Computer Classroom): Digital Terrain Model (DTM). Design and calculation of a simple road (second part).

Practice 4 (Field): Stationing of topographic devices. First steps with the total station.

Practice 5 (Field): Topographic survey of a campus area with a total station. It will emphasize the importance of planning and order in the realization of a topographic work.

Practice 6 (Computer Classroom): Digital terrain model (DTM). Design and calculation of a complex road (first part).

Practice 7 (Computer Classroom): Digital terrain model (DTM). Design and calculation of a complex road (second part).

Practice 8 (Computer Classroom): Digital Terrain Model (DTM). Design and calculation of a complex road (third part).

Practice 9 (Field): Practical example of a stakeout of points with SSNG RTK.

Methodology

The methodology used in the subject is as follows:

- Master class (48%): the objective is to present the basic concepts in topography and cartography, as well as the principles for the development of digital terrain models. Most part of this master class could be in a

virtual mode if the health situation it requires.

- Computer room (40%): practical exercises will be carried out in order to consolidate the concepts acquired in the theoretical part, learn to process geographic information from different sources, and use informatic programs to deal with geographic data.
- Field practices (12%): the objective is to obtain the necessary skills for the acquisition of field data through the total station and GNSS RTK systems.

Software used:

- Autocad.
- TcP MDT.
- QGIS.

Development plan

A detailed planning of the subject will be loaded in the Resources section of the Virtual Campus at the beginning of the course. The planning will contain the distribution of the credits in the different activities and the dates, places and professors of each one.

Evaluation

The evaluation of the course will be done according to the evaluation regulations approved by the UdL. This regulation establishes that the standard evaluation is the continuous evaluation. The grades that will be taken into account in this continuous evaluation are the following:

- Theoretical exam 1st partial (30% of the final grade): written test in which will be asked about the theoretical concepts explained during the classes given before the exam.
- Theoretical exam 2nd partial (30 % of the final grade): written test in which the theoretical concepts explained during the classes given since the exam of the 1st partial will be asked about
- 3 exercises of computer classroom and field practices (40 % of the final grade): in each one of the practices a script will be distributed that will include practical exercises and questions that will have to be completed individually. The questionnaire or script will include questions on the practical applications of the topics taught and their execution. The grade will be obtained from the average of the grade obtained in the 3 exercises.

Observations

- The course is approved with a grade equal to or higher than 5 points out of 10 calculated from the previous weightings.
- In order to pass the course, it is necessary to obtain a minimum of 4 points out of 10 in each of the 3 grades mentioned above.
- In case of not reaching the minimum grade in any of the parts, the overall grade of the course will not be higher than 4 points out of 10.
- If a student cannot follow the continuous evaluation, he/she must inform the coordinator of the course at the beginning of the classes.
- The attendance to the practicals is compulsory (it will be allowed to miss a maximum of 10% of the practicals, as long as they are of computer classroom, except in those of SSNG).
- Only the recovery of the exams is contemplated, in case of failing them. **The rest of the activities are not recoverable.**
- In order to make a fair evaluation to all students, plagiarism in the activities will be meticulously pursued. **Any plagiarized activity will count 0 points in the evaluation.**

Bibliography

Recommended bibliography

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[27] <https://www.ign.es/web/ign/portal>