

**Bachelors Degree Final Project**

Code: 106546  
ECTS Credits: 6

Degree	Type	Year	Semester
2503743 Management of Smart and Sustainable Cities	OB	3	2

### Contact

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### Use of Languages

Principal working language: catalan (cat)  
Some groups entirely in English: No  
Some groups entirely in Catalan: No  
Some groups entirely in Spanish: No

### Prerequisites

The prerequisites for the Bachelor's Degree Final Project (or TFG from its Catalan acronym) are those included in the UAB's progression plans (registration progress), which specifies that, in order to be able to register for the TFG, students must have passed, at least all first-year courses and a minimum of two thirds of the total ECTS in the degree's syllabus (that is, 120 ECTS). It is recommended that students register for the TFG when they are in position to complete their degree studies in the same academic year in which the TFG would be submitted.

### Objectives and Contextualisation

The TFG should be seen as a globalizing subject facilitating an integrated assessment of the competences associated with the degree. It represents the culmination of the learning process in which students should show a level of maturity in multiple competences and learning outcomes. Students must demonstrate their ability to integrate and put into practice the knowledge, skills and attitudes acquired throughout their studies and thereby facilitate the assessment of their professional capacity.

### Competences

- Carry out projects related to the management, equality and sustainability of cities applying elements of technological innovation such as ICT.
- Critically analyse work carried out and demonstrate a desire to improve.
- Demonstrate creativity, initiative and sensitivity in the different social and environmental topic areas.
- Generate innovative and competitive proposals in professional activity.
- Identify and interpret social, economic, technological and sustainability challenges in different areas such as: town planning, infrastructures, mobility, urban economies, services and equipment, cultural diversity and social inequality, energy and natural resources, waste, etc.
- Measure the technological infrastructure necessary to respond to the needs of cities, understanding the interactions between technological, social and operational aspects of cities.
- Prevent and solve problems, adapt to unforeseen situations and take decisions.
- 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.
- Students must develop the necessary learning skills to undertake further training with a high degree of autonomy.

## Learning Outcomes

1. Cite the sources of information used in accordance with internationally recognised standards.
2. Critically analyse work carried out and demonstrate a desire to improve.
3. Defend the solutions proposed, or the synthesis elaborated, through logical and coherent arguments.
4. Demonstrate creativity, initiative and sensitivity in the different social and environmental topic areas.
5. Describe the relation between work developed and the social, economic, technological and sustainability-related challenges in cities.
6. Establish the hypotheses of a particular work, justifying its validity based on the results previously obtained by the student or by third parties.
7. Evaluate both the resources and the personal and environmental constraints that would make work-planning realistic.
8. Explain the search strategy for the information used, showing that the most relevant sources in the field of study have been consulted.
9. Generate innovative and competitive proposals in professional activity.
10. Prevent and solve problems, adapt to unforeseen situations and take decisions.
11. Rationally explain the distinct technological alternatives that have been considered in establishing means to tackle the problem initially raised.
12. 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.
13. 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.
14. Students must be capable of communicating information, ideas, problems and solutions to both specialised and non-specialised audiences.
15. Students must develop the necessary learning skills to undertake further training with a high degree of autonomy.

## Content

### What is the TFG (Bachelor's Degree Final Project from Catalan: Treball de final de grau)?

The TFG is an original work that should be carried out individually and presented and defended before a university examination committee. It consists of a project within the field of Smart Cities, of a professional nature, synthesizing and integrating the competences acquired throughout the degree.

This project represents a student workload of 150 hours. Therefore, the project must have well-defined start and end points as it must be able to be completed in 150 hours in a single semester.

Each project must be considered unique and original. This does not mean that it needs to be innovative or to produce improvements with respect to other similar solutions. But it must be unique in terms of its resolution. It is therefore possible for distinct students to carry out the same project or to divide a large project among several students.

### Who can propose TFGs?

a) Lecturing staff/departments. Following the calendar approved by the School, staff or departments should propose topics/projects using the corresponding computer

application. If deemed appropriate, the person responsible for the TFGs and/or the TFG Committee will determine whether the proposed projects are appropriate.

b) Companies or external institutions. The project can be carried out in the framework of a collaboration agreement with a company or external institution. The entity must submit the proposal in writing (following the model established for this purpose, on the dates specified) to the responsible for the TFGs. This staff member and/or the TFG Committee will determine whether the proposed project is appropriate (assessing whether the competences established for the degree can be evaluated and ensuring that the duration and workload are suitable). If the proposal is accepted, a tutor will be assigned to it and all relevant data will be logged into the application. These projects are supervised by an academic tutor from the School and by a tutor from the company.

c) Students. Students can make a proposal in writing (following the model established for this purpose, on the dates specified) referring to a specific topic or project to the lecturer responsible for the TFGs. Acceptance is not immediate, as assessment must first be made of whether the competences established for the degree can be evaluated, and that the duration and workload are suitable. If accepted, this lecturer will instruct the student to find a tutor. If the student is unable to find a tutor, they will have a tutor assigned to them at the end of the assignment process.

## **Methodology**

The classroom on the UAB Virtual Campus and/or the TFG follow-up application will specify the calendar/timeline to be followed, the mechanism for consulting and selecting proposals, and the project-assignment system.

Students must complete the TFG in a single semester and have only one exam session in which to present it. Project assignment must be completed during the week prior to the beginning of the semester.

Once the TFG has been assigned, the tutor and student will meet during the first week of the semester to determine the work to be carried out and to define the general guidelines for monitoring the project.

The tutor will carry out project follow-up through a minimum of 4 tutorial/supervision sessions. Before each of these, the student must submit a document outlining the current state of the project, specifying the work carried out in each of the stages and the procedures that are being carried out to ensure its completion.

A possible schedule for the follow-up sessions is given below.

- 1st session (week 4): the student submits an initial report.
- 2nd session (week 9): the student submits an extended version of the report.
- 3rd session (week 14): the student submits a more completed version of the report.
- 4th session (week 17): the student submits the proposal for the final report.
- 5th session (week 18-19): the student submits the proposal for the presentation.

Reports will be assessed in accordance rubrics that will be made public through the Campus Virtual.

The final report will adhere to the format and rules given, which will be based upon IEEE Computer Society paper format style.

Public defense consists of a work presentation before an evaluation committee of three people, including TFG advisors when possible. Time for presentation cannot exceed 15 minutes and Q&A session will have a similar duration.

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: Supervised			
Follow-up meetings	5	0.2	2, 3, 8, 11, 14
Report and paper writing, preparation of presentation	24	0.96	2, 1, 3, 5, 6, 8, 11, 14
Type: Autonomous			
Project development	120	4.8	7, 4, 6, 9, 10, 15, 12, 13

## Assessment

Assessment of TFGs is divided into two parts: the one of the tutor and the one of the TFG assessment committee. The corresponding grades weight 40% and 60% of the final grade, respectively.

In the case of the committee's mark, it will be differentiated between the final report (30%) and the defense of the work (30%).

Assessment rubrics will be public and accessible from the Virtual Campus.

To obtain a passing grade, each part must be passed separately (tutor's assessment, the report and the defense of the work). If not, the mark that will be awarded will be the lowest value between 4.5 and the weighted average.

In case of failing, students can be re-assigned to the same project next academic year with the consent of the tutors.

The final grade will be "non-assessable" only in case no report has been submitted.

If it is shown that part of the TFG has been plagiarized and/or prepared by a third person other than the enrolled student, it will be scored 0.

The assessment committee may propose the motivated honors award to one or several works provided that they have obtained a final mark equal or greater than 9. In the event that the number of students with this distinction can not exceed 5% of the number of students enrolled in the course, it is given to whoever decides the responsible for the TFGs and/or the TFG Committee upon the student records.

## Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Advisor evaluation	40	0	0	2, 7, 1, 3, 4, 5, 6, 8, 11, 9, 10, 15, 12, 13
Final report (assessment committee)	30	0	0	7, 1, 4, 5, 6, 8, 11, 9, 15, 14, 12, 13
Presentation and defense	30	1	0.04	2, 3, 11

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## **Bibliography**

(To take into account when writing reports and preparing the presentation.)

1. Alley, M. (2013). *The craft of scientific presentations: critical steps to succeed and critical errors to avoid*. Springer-Verlag.  
[<http://www.writing.engr.psu.edu/csp.html>]
2. Alley, M. (1996). *The craft of scientific writing*. 3e. Springer-Verlag.  
[<http://writing.engr.psu.edu/csw.html>]

## **Software**

(Depending on the work to be done.)