



## Course guide

### 250838 - TFM-METER - Master's Thesis

**Last modified:** 25/01/2024

**Unit in charge:** Barcelona School of Civil Engineering  
**Teaching unit:** 751 - DECA - Department of Civil and Environmental Engineering.

**Degree:** MASTER'S DEGREE IN GEOTECHNICAL ENGINEERING (Syllabus 2015). (Project subject).

**Academic year:** 2023    **ECTS Credits:** 30.0    **Languages:** Spanish

#### LECTURER

---

**Coordinating lecturer:** JEAN VAUNAT

**Others:** JOSE RAMON GONZALEZ DRIGO, ANNA RAMON TARRAGONA, FRANCISCO JAVIER SANCHEZ VILA, JEAN VAUNAT

#### DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

---

**Specific:**

13319. To develop, present and defend in front of a university evaluation panel an original individual exercise. This exercise consists in a full study or project in the field of Civil Engineering that synthesizes the competences acquired during the studies, adopting the advances and upgrades in this field and suggesting new ideas.

**Generical:**

13300. To apply advanced knowledge in sciences and technology to the professional or research practice.  
13301. To lead, coordinate and develop integrated projects in Geo-Engineering.  
13302. To identify and design solutions for geo-engineering problems within ethical, social and legislative frameworks.  
13306. To promote innovation for the development of methodology, analyses and solutions in Geo-engineering

#### TEACHING METHODOLOGY

---

The TFM will be developed under the supervision of a faculty member of the Civil engineering School of Barcelona. Therefore, student must require the necessary interviews with the supervisor to ensure the proper development and quality of the work. In case the TFM is presented and defended at a foreign university within the framework of mobility agreements signed by the Civil engineering School of Barcelona, the student must find a supervisor at the host university.

## LEARNING OBJECTIVES OF THE SUBJECT

---

To develop, present and defend in front of a university evaluation panel an original individual exercise. This exercise consists in a full study or project in the field of Civil Engineering that synthesizes the competences acquired during the studies, adopting the advances and upgrades in this field and suggesting new ideas.

- \* To acquire the knowledge, developing capability and preliminary practice to carry out research works or specialty projects in some of the civil engineering fields.
- \* To acknowledge the significance of studying in detail and rigor the problem at hand, of considering all the potential alternatives, of analyzing and deciding which is the optimum one and of developing the chosen alternative completely.
- \* To know in greater detail the specific knowledge area of their field of work with regards to the general and specific topics of the MSc degree.
- \* To focus, plan and develop adequately and efficiently a new topic including all the phases (background, analysis, synthesis, discussion, writing and defense).
- \* To consolidate the basic methodologic knowledge to develop research or development works and projects in civil engineering.

To make, present and defend in front of a university tribunal an original exercise realized individually. The exercise should consist of a comprehensive study or project in the field of Geo-Engineering, allowing the student to develop, apply and synthesize the skills acquired in the Master courses and resulting in advances and developments in this field by contributing with new ideas.

PROMOTION AND MANAGEMENT OF ENGINEERING PROJECTS: The ability to identify and study society's needs and to transform these needs into infrastructure and services projects. The ability to write, develop and implement a project using knowledge of basic subjects and technologies; decision-making abilities; the ability to meet the needs for which it is designed; the ability to assess the social and environmental impact of the technical solutions adopted; and the ability to assess the funding and material and human resources needed to carry it out.

## STUDY LOAD

---

Type	Hours	Percentage
Guided activities	90,0	12.00
Self study	660,0	88.00

**Total learning time:** 750 h

## CONTENTS

### TFM

#### Description:

Work load

The estimated workload of TFM is 4 months full time. The development of TFM will always be guided by a supervisor. The supervisor will be always a professor of the Civil Engineering School of Barcelona when the TFM isn't developed within an exchange program at a foreign university. This supervisor must perform a function of student guidance and advice throughout the process, from the moment of topic selection. It is also responsible for authorizing or not the presentation of TFM in a panel of examiners. Only after the approval of his/her supervisor, the student can submit the TFM project. Additionally, the student may have an external supervisor (from the professional field, out of the University).

Description

#### 1. Type of TFM

The TFM may include:

- \* An engineering project, basic or constructive
- \* A technical study
- \* A research project

In either of these modes, it is necessary that the topic of TFM has a clear connection to civil engineering and the subjects studied in the master. It has to be an original work of the student.

#### 2. TFM documents

Students must write a report whose structure depends on the type of TFM. This report can be written in Catalan, Spanish, English or French. The use of other languages must be approved by the Head of Studies.

##### 2.1 Engineering Project

If TFM is a construction project, the TFM documents should include: 1. Report and Annexes 2. Maps 3. Terms of Reference 4. Budget. In this case, it will be appreciated that the project is complete in all its documents and that the student has applied knowledge of various branches of civil engineering, showing a wide overview of constructive development and the integration of constructive solution in the territory. Apart from the technical proposal, an economic sustainability study and the execution plan of the work should be addressed.

If TFM is a basic project, the documentation should include: 1. Report and Annexes 2. Maps 3. Terms of reference (may not exist) 4. Budget (there will be at least an economic assessment). The basic perspective of this TFM makes it unnecessary to reach details in all documents (as in a construction project), but requires more effort on specific aspects of this TFM as alternative studies or economic studies.

##### 2.2 Technical Study

If TFM is a technical study, the report must contain at least the following chapters: 1. Executive Summary 2. Description of the subject of study 3. State of the art 4. The analysis and / or the proposed solution 5 . The conclusions.

##### 2.3 Research Project

If TFM is a research project, the documents must contain at least the following points: 1. Summary 2. Introduction and Objectives 3. State of the art 4. Methodology 5. Results 6. Conclusion 7. References. It should emphasize the novel research contributions in the field.

#### Specific objectives:

TFM objectives are:

- \* Provide an overview of the concepts addressed in the degree, which allows to integrate knowledge from different branches of civil engineering.



- \* Stimulate creativity, originality, innovation, entrepreneurship and ability to face challenges and solve problems.
- \* Deepen important capabilities of a Civil engineer, such as preparing studies, decision making, research, work planning, oral and written presentation, etc.

**Full-or-part-time:** 2h 24m

Laboratory classes: 1h

Self study : 1h 24m

## GRADING SYSTEM

---

The grading of TFM will be based on an assessment of written documents and oral presentation about the objectives, results and conclusions of TFM to a panel of examiners. The panel will consist of three professors of the School that after the public presentation of TFM assigns a grade based on the following criteria:

Thesis content

- \* Originality and innovation (30% of global mark)
- \* Comprehensive / integrative / interdisciplinary scope (30% of global mark)

Thesis report

- \* Quality of written report (20% of global mark)

Thesis defense

- \* Clarity of oral presentation (10% of global mark)
- \* Performance in debate with the panel (10% of global mark)

In the case of performing the TFM within a mobility agreement in a foreign university, the final mark will be given by the host university if the work has done individually and has been presented to a panel of at least three faculty members. If these requirements are not met, the student must present and defend TFM in the Civil Engineering School of Barcelona.

## EXAMINATION RULES.

---

Students have two periods for the TFM submission and defense: February and July. Students must submit the TFM report in digital format with electronic signature (via e-secretaria). Moreover, students should provide a list of the main contributions ("highlights") with a written and graphic summary of TFM in the Open Courseware portal.

The TFM will be defended in public session with a panel of three professors from the Civil Engineering School of Barcelona. Students will have approximately 30 minutes to proceed to the oral presentation of the objectives, results and conclusions of TFM. After the presentation, the jury will start a debate with the student, answering some questions about the development and content of the TFM. In the TFM defense room, a computer and a projector will be available to display graphic documents (Microsoft Powerpoint or other).

## BIBLIOGRAPHY

---

**Basic:**

- Escola de Camins. Normativa acadèmica del Màster de Camins, Canals i Ports en tot allò referent al TFM (capítol 5).