

**ETSETB Academic Regulations for MET and MEE
Master Degree Theses
(TFM - Treball Fi de Màster)**

**MÀSTER EN ENGINYERIA DE TELECOMUNICACIÓ (MET)
MÀSTER EN ENGINYERIA ELECTRÒNICA (MEE)**

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The syllabus requirements for a Master in Telecommunications Engineering (MET) and a Master in Electronic Engineering (MEE) stipulate that all students must complete a Master Thesis (TFM) in the respective fields of these courses. The organization, enrolment procedures and evaluation of the MET and MEE Master Theses are governed by the following regulations:

1. Master thesis (Treball fi de màster - TFM)

1. The TFM should be an original work consisting of a comprehensive project in the field of telecommunications engineering in MET or in the field of electronic engineering in MEE which the skills and knowledge acquired throughout the course are synthesized. This assignment must be completed individually by the student who will be supervised by a thesis advisor.
2. The TFM should be deposited and then defended before an Evaluation Board once all other ECTS credits have been satisfied.
3. The TFM workload for each student consists of 30 ECTS, each of which corresponds to 25 - 30 hours of work.
4. The TFM must be completed individually. However, should the institution and/or the complexity of the TFM project justify it, several students may work together as a team on the same Master Thesis subject [Point 10].

2. TFM Methodology

The content, management and documentation of the TFM should comply with the following compulsory requirements:

1. Faculty members authorized to supervise a TFM [Point 3] may suggest a TFM topic and assign it to a student who requests it. A student may also propose a topic directly to a faculty member authorized to supervise a TFM. Should the faculty member approve the proposal, then he/she becomes the advisor of the said TFM. In either of these cases, it is necessary to follow the respective guidelines established for these procedures [Procedures 1 and 2].
2. Students must be duly enrolled in the TFM when they commence their TFM [Procedure 3].
3. The evaluation board will be assigned during the enrolment process.
4. As regards TFM evaluation, students are required to submit their Master Thesis dissertation in English, which should at least contain the following:
 - Abstract: short description of the work to be done, with its requirements and specifications, explicitly mentioning if it is based upon previous work by the student's advisor, a previous project or similar.
 - Work plan: tasks, objectives to be achieved and Gantt chart.
 - State of the art of the technology employed.

- Project development.
- Results.
- Cost assessment.
- Conclusions and future development.

Once the dissertation is finished, it should be uploaded on the ETSETB Intranet for assessment by the Evaluation Board.

5. Public defence of the TFM can only be conducted if the evaluation of the Master Thesis dissertation is favourable. The student arranges the time and date for the defence with the Evaluation Board, notifies the Academic Office of the outcome and reserves the presentation room.

3. TFM advisor

1. In order to act as a TFM advisor, it is mandatory to hold a Master Degree according to the provisions laid down in *Real Decreto 1393/2007* of 29 October, amended by *Real Decreto 861/2010* of 2 July, or alternatively a PhD.
2. The TFM advisor must be a UPC staff member and belong to the ETSETB.
3. Shared supervision of the TFM with two co-advisors is possible if at least one of these advisors fulfils the conditions specified in paragraphs 3.1 and 3.2.
4. Should the TFM be undertaken while on work placement, or within the framework of a mobility program, or at another college or department in which the TFM advisor does not meet the conditions mentioned in paragraphs 3.1 and 3.2, there should be another co-advisor who fulfils the established requirements. This co-advisor will form part of the evaluation board and will supervise the student's work in order to ensure that the TFM complies with the academic standards required by the ETSETB.

4. Enrolment for the TFM

1. Prior to enrolment, the advisor must propose the TFM [Procedure 1] and it must be accepted by both advisor and student [Procedure 2].
2. On enrolment for the TFM [Procedure 3], the student reaches the maximum number of ECTS credits for the degree. This means that on enrolling for the TFM, the student may not have any other outstanding ECTS credits.
3. Should the TFM not be evaluated during the semester in which enrolment was made effective, then according to the Academic Regulations for Master Degree Courses at the UPC (NAMU) students are required to enrol for the TFM again in the following semester, in which case they will have an additional period to defend their thesis. On re-enrolment, students are required to pay administrative charges for management of the academic record, learning support and student insurance, if applicable, although they will not be required

to pay for credits corresponding to the TFM. Should students not defend their TFM in this additional period which duration is also defined in the NAMU, they will be required to register again and pay the total amount in terms of both fees and ECTS credits.

4. If the TFM is not evaluated within the semester when it was registered or within the additional period defined in the previous point, it will be regarded as NP (No Award).
5. A semester officially finishes one working day prior to the commencement of classes of the next semester.

5. Evaluation Board

1. In order to act as a TFM evaluation board member, it is mandatory to hold a Master Degree according to the provisions laid down in *Real Decreto 1393/2007* of 29 October, amended by *Real Decreto 861/2010* of 2 July, or alternatively a PhD.
2. Only faculty members with a UPC employment contract and who fulfil one of the following requirements are eligible for membership of a TFM evaluation board:
 - They are teaching at the ETSETB during the academic year in which the student enrolls for the TFM, or they have taught in any of the two academic years prior to that.
 - They are exclusively bound to the ETSETB.
3. The evaluation board will consist of a President, a Secretary and one other Board Member.
4. The Secretary of the evaluation board will be the TFM advisor or a co-advisor. If neither the advisor or the co-advisors fulfil the requirements to be a TFM evaluation board member, the Head of Master Studies will designate a Secretary.
5. The Master coordinator will designate two candidates; one for President and one for deputy President.
6. The Head of Masters Studies will be responsible for the designation of the third board member and a substitute, who will be selected from among faculty members qualified to be members of an evaluation board, but who do not belong to the same department as the President and the Secretary. Designated Board Members are allowed to decline the appointment within a period of five working days, as long as they justify their decision in writing.
7. The TFM advisor or co-advisors may exceptionally request the Head of Master Studies to appoint a particular faculty member as a member of the evaluation board. Notwithstanding, the President and the third Board Member must belong to different departments.

8. The Academic Office will officially inform the student of the composition of the evaluation board and its members via email.

6. Public defence of the TFM

1. When the student, in agreement with his/her Master Thesis advisor, considers that the thesis has been completed, the student will upload his/her Master's Thesis dissertation to the ETSETB Intranet. The Secretary of the evaluation board validates the file on the same website at least one week before the date of the defence.
2. The evaluation board has at least one week to assess the dissertation and authorize its defence [Procedure 4]. Should any members of the evaluation board wish to have a hard copy of the TFM dissertation, they are to request one from the student.
3. Should any member of the evaluation board consider that the work lacks sufficient quality to be accepted, he or she shall notify the Secretary of the evaluation board who in turn will notify the student as well as the other members of the evaluation board and the ETSETB Head of Master Studies. In such an event, the Head of Master Studies will meet with the members of the evaluation board to discuss what action to take.
4. In parallel with or after the deposit of the TFM dissertation, the student agrees on a date and time for the defence of the TFM with the evaluation board and reserves a classroom [Procedure 4]. He/she will subsequently communicate this information to the Academic Office at least 5 working days prior to the defence of the TFM.
5. The Academic Office will notify the student and the members of the evaluation board of the date, time and place for the TFM defence and will provide the evaluation board Secretary with the official evaluation record. The Academic Office will also publish the date of the TFM defence.
6. The defence of the TFM consists of an individual and public presentation before an evaluation board, with an oral summary of the contents of the work, together with the results and the methodology used.
7. The public presentation of the TFM is conducted in English.
8. Once the presentation has finished, the student will answer any questions that the evaluation board members deem necessary regarding to the content and preparation of the TFM.

9. The estimated time for the TFM defence is 45 minutes:
 - 30 minutes for the oral presentation.
 - 15 minutes for questions and answers.

7. **Evaluation of the TFM**

1. The TFM is evaluated by a board assigned for that purpose.
2. If the TFM is the result of teamwork by different students on the same Master Thesis topic, a single TFM evaluation board may be set up to evaluate each student individually. In any case, each student must prepare a TFM dissertation and a public presentation in which their own contribution must be clearly reflected.
3. All evaluation board members must attend the defence of the TFM in order for it to be valid. In the exceptional case where one of the members is unable to not attend the evaluation, the remaining members, in accordance with the student, are authorized to appoint a substitute who fulfills the same requirements as the absent member. Otherwise, the evaluation session must be postponed.
4. Once the evaluation has finished, the Secretary of the evaluation board fills out the official evaluation record and delivers it to the Academic Office.
5. The TFM evaluation record will include the following information: number of credits, a numerical mark with a resolution of 0.1 points, a descriptive mark and a Distinction proposal, if it deemed appropriate.
6. In order to determine the numerical mark, the evaluation board will take into special account the scientific or technical quality of the work, the clarity of the presentation, oral defence, response to questions and, if applicable, the economic feasibility study and environmental impact and/or sustainable development.
7. The descriptive mark is determined in accordance with the following scale:
 - Excellent / Distinction: 9,0 - 10,0
 - Good: 7,0 - 8,9
 - Pass: 5,0 - 6,9
 - Fail: 0,0 - 4,9
8. The evaluation board proposes the Distinction, if deemed appropriate, and in this case, the Academic Commission of Masters will assign the Distinctions without exceeding the maximum number established by the master's academic regulations of the UPC. If the number of Distinctions proposed by the evaluation boards is higher than the allowed, the Academic Commission of Masters will define the way to award them using objective criteria.

8. TFM in a mobility program and double-degree

1. Should the TFM be undertaken within the framework of a student mobility program and/or a double-degree, supervision is shared between two advisors: one co-advisor belonging to the student's own centre and another from the UPC who meets the requirements specified in Point 3 of these regulations. The UPC co-advisor shall assume all the functions assigned to the advisor in the present regulation.
2. Should the TFM be undertaken within the framework of a student mobility program, the oral defence and assessment of the TFM may be conducted at the institution to which the student belongs. The ETSETB will subsequently recognize the validity of the TFM and its evaluation by an evaluation board set up expressly for this purpose. This evaluation board may decide to abide by the rating awarded by the student's own institution centre or assign a different one.
3. Should the TFM be undertaken within the framework of a student mobility program, the ETSETB management team reserves the right to decide whether the TFM defence should be conducted at the ETSETB. This right is exercised whenever the oral defence has not been done at the institution to which the student belongs, together with the corresponding assessment, or in other cases where this may be deemed necessary.
4. Should the TFM be undertaken within the framework of a double-degree program, the student has to conduct a TFM defence in both institutions.
5. The TFM dissertation handed in for evaluation of the Master Thesis at the ETSETB may be the same as that required by the student's own institution, provided that it meets the requirements set out in Point 2.4 of these regulations.

9. TFM in work placement (PAEC)

1. The TFM may be undertaken while on work placement under the rules of the *Pràctiques Acadèmiques Externes Curriculars* (PAEC).
2. If the TFM is undertaken at a company, supervision is shared direction between two advisors: a co-advisor from the company who holds a master degree or a second cycle university degree, and a co-advisor belonging to the UPC who fulfills the conditions set out in paragraph 3 of this regulation. The UPC co-advisor shall assume all the tasks assigned to the advisor according to the present regulation.

10. TFM in teamwork

1. The TFM is done individually. However, should the complexity of the TFM topic justify it, two students may work together on the same Master Thesis topic.

2. In this case, each student prepares a TFM dissertation whose titles must be different from each other and in which the tasks of each student in the Master Thesis are clearly indicated.
3. The same TFM evaluation board evaluates each student separately. Each student conducts a public defence of the TFM in which his/her individual contribution is clearly demonstrated.

11. Deposit of the TFM dissertation

1. The ETSETB will publish the TFM dissertation in UPCommons, the open access portal of the *Servei de Biblioteques, Publicacions i Arxius* of the UPC (Category Attribution - Non commercial - No Derivative Works) or similar. The student must sign the "Consent to publication of the TFM dissertation in UPCommons" document and hand it in to the Academic Office.
2. Should the work be of a confidential nature, it will not be published in UPCommons but stored with the providers of the UPC *Servei de Biblioteques, Publicacions i Arxius*, and only bibliographic information and the abstract will be available. Students must sign the "Justification for confidentiality" document and hand it in to the Academic Office.
3. Should the confidentiality of the work be for a fixed period of time, when it ceases to be confidential it will be published under CreativeCommons license (Category Attribution - Non commercial - No Derivative Works) or similar.
4. If the TFM dissertation contains literal replicas of articles published in journals or conferences to which the author has transferred the rights of publication, this report may not be published by UPCommons.

12. TFM confidentiality

1. During the process of uploading the Master's Thesis dissertation to the intranet of the ETSETB, the student and the advisor sign electronically the agreement of confidentiality or non-confidentiality of the TFM. The agreement of confidentiality or non-confidentiality shall be governed by the UPC's intellectual property regulations.
2. It should be pointed out that confidentiality only affects to the publication of the dissertation, but even in this case, the Master Thesis defence is still a public event.

13. Resourcing

1. On undertaking the TFM, the ETSETB will provide students and advisors with the measurement instrumentation, laboratories and Information technology (IT) resources available at the centre, without detriment to the teaching activities arising from the subjects taught. Notwithstanding the above, the scientific and

technical resources available to their respective departments will also be made available.

14. Transversal skills associated to the TFM

1. The transversal skills that are taught at the ETSETB and which are therefore likely to be intensified during the course of the TFM are as follows:
 - CT1: Entrepreneurship and innovation.
 - CT2: Sustainability and social commitment.
 - CT4: Effective use of information resources.
 - CT5: Foreign language.

Annex: Information about procedures

The ETSETB has defined and established the following procedures to ensure the implementation of these regulations, which will therefore be compulsory:

- **Procedure 1 – TFM PROPOSAL PROCEDURE:** Linked to an Intranet application.
- **Procedure 2 – PROCEDURE FOR ACCEPTANCE OF THE STUDENT BY THE DIRECTOR:** Linked to an Intranet application.
- **Procedure 3 – TFM REGISTRATION PROCEDURE:** Registration at the Academic Office.
- **Procedure 4 – PROCEDURE FOR THE DEFENCE OF THE TFM:** Procedure for admission of the Master Thesis defence, classroom reservation and delivery of the official evaluation record. Linked to an Intranet application.