

**PhD  
Program in  
Electrical and  
Computer  
Engineering**

**THESIS SUBMISSION GUIDELINES**

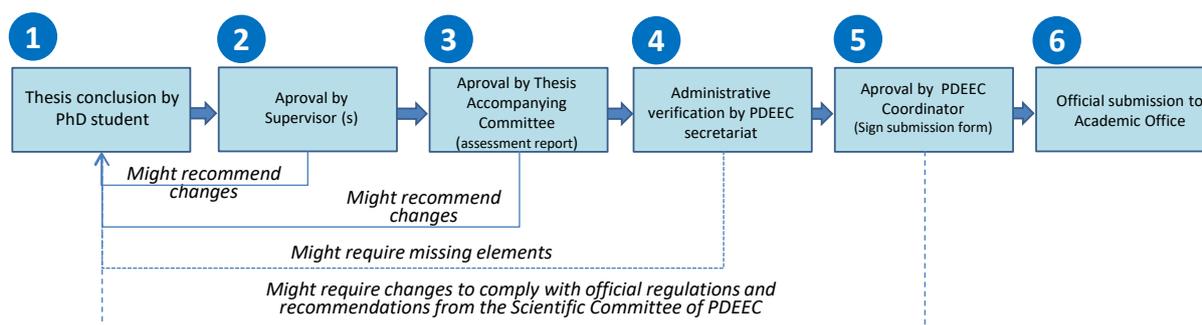
**2016/2017**

Along the years it has been observed that some supervisors and PhD students have some difficulty in properly following the various procedural steps related to the thesis submission and evaluation.

This difficulty often causes additional delays with an obvious negative impact on the life of the PhD candidates.

The following guidelines are thus prepared in order to provide a quick guide for the various processes of this last phase of the PhD work.

## PhD DISSERTATION SUBMISSION STEPS



1

- **PhD Student:** After finishing the thesis writing, must verify that the Guidelines for Thesis Preparation, as well as the formatting rules of UNL, are strictly followed.
- Must also prepare his/her CV and a list of publications (ensuring that the required publications are available).

2

- **Supervisor(s):** Either agree(s) that the dissertation is ready to be submitted or require(s) further improvements, giving specific guidance on what to improve.

3

- **TAC:** All members of the Thesis Accompanying Committee individually assess the quality of the document.
- If they agree that the document is ready for public defense, they shall jointly issue an assessment report, using a specific template.
- Alternatively they may recommend further improvements, giving specific guidance on what to improve.

4

- **PDEEC Secretariat:** Verifies if all pre-requirements for thesis submission are fulfilled. Namely, checks:
  - If the Student finished all courses of the program.
  - If all annual Progress Reports have been submitted.
  - If all relevant information items (thesis title, abstract, etc.) are included in CLIP system.
  - If all elements (copies of the dissertation, in paper and electronic, CV, TAC assessment report, list of publications, thesis submission form) are provided.

5

- **PDEEC Coordinator:** Verifies:
  - If the package of submission documents is complete.
  - If the PhD student has the required number of publications.
  - If the thesis follows the guidelines issued by the Scientific Committee of the program.
- If all elements are correct, the “thesis submission form” is signed by the Coordinator.
- In case any element fails, the PhD student is asked to solve the pending issues.

6

- **PhD Student:** Delivers the full package to the Academic Office – Post-Graduation Unit.

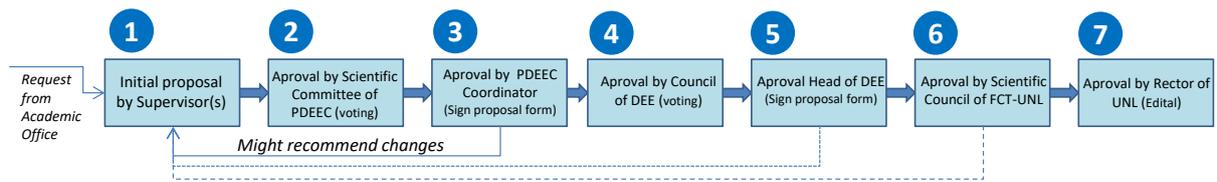
**Duration:** The overall duration of this process depends on the number of feedback loops that are necessary and the time required for assessment in steps 2, 3, and 5. Typically the student should consider, at least, a window of 1.5 to 3 months.

Every academic year, FCT-UNL defines a deadline for theses’ submission in that year. Please notice that such deadline refers to step 6.

Tips to reduce this duration:

- Make sure that all recommendations and guidelines are strictly followed.
- Try to get a fast response from the Supervisor and TAC (steps 2 and 3).
- A complete draft of the thesis can be submitted to TAC even before the final “cosmetic formatting” – which can help gaining some time – but this submission should only happen with the agreement of the Supervisor.

## JURY PROPOSITION STEPS



1

- **Supervisor(s):** Although the formal proposition of the Jury starts with the Coordinator, it is common practice that an initial (pre-)proposal is made by the supervisor(s), following the requirements for Jury composition.
- The Supervisor(s) shall also contact the suggested members to check about their willingness to participate in such panel. Note: Since the final decision regarding the Jury will only take place at a later stage, this contact should not be a formal invitation but rather a prospective contact to check if they agree to be part of the proposal.

2

- **SC.PDEEC:** The Scientific Committee of the program, on request of the Coordinator, check the proposed Jury, namely in terms of compliance with the Law, and having a composition that gives guarantees of a proper assessment of the thesis work.
- The SC may suggest modifications to the Jury proposal (adding / removing members).

3

- **PDEEC Coordinator:** In case of positive assessment from the SC of the program, the Coordinator formalizes the “Jury proposal” by signing the corresponding form.
- *Note: According to the PhD regulations of UNL, the Jury proposal is made by the Coordinator after consulting with the Supervisor and the SC of the program.*

4

- **DC.DEE:** The members of the Department Council (of DEE) are asked to vote yes/no the “Jury proposal”.

5

- **Head of DEE:** In case of a positive vote of the Department Council, the Head of department also signs the Jury proposal document which is then submitted to the Academic Office and Scientific Council of FCT-UNL.

6

- **SC.FCT:** The Scientific Council of the faculty approves or requests changes to the Jury proposal.
- This step is typically done by the Permanent Commission of the SC. Only in case any issue is raised, the proposal is analyzed by the plenary of the SC.

7

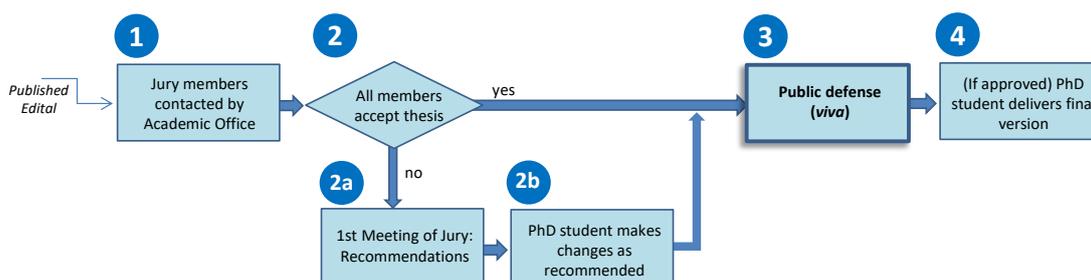
- **Rectorate:** In case the Jury proposal is approved at the Rectorate level, then it is made public through the publication of a public Notice (“Edital”).

**Duration:** Typically the student should expect a window of 1 to 1.5 months.

Tips to reduce this duration:

- Make sure that the initial (pre-)proposal follows both the legal requirements and the recommendations of the Scientific Committee of the program.
- Besides the legal requirements [at least two main opponents, one supervisor, and an additional member], the SC.PDEEC has been using the following practice:
  - Although not required by Law, it is recommended to include in the Jury both the President and the External Member of the TAC. These members have closely followed the research work and thus are well prepared to make a sound assessment.
  - In addition to the minimal requirements, it is recommended to include one or two additional external members, experts in the specialization area of the PhD (but not necessarily working on the specific topic of the thesis) and that have no relationships to the PhD work or the host research group.
  - A balance between internal and external members shall be tried.
  - It should be avoided to have always the same names for the Jurys in a given area. Diversification is strongly recommended.
  - Since the Rector usually delegates the presidency of the Jury in the Dean of FCT-UNL, and the Dean often sub-delegates the presidency in a full professor, it is recommended to include at least one full professor in the Jury. This professor can be from DEE or another department of FCT, always trying to have one familiar with the specialization area.
- According to the Law, in case there are more than one supervisor (co-supervisors), only one - either the supervisor or one (of the) co-supervisor(s) - can be part of the Jury.

## PhD DISSERTATION EVALUATION STEPS



1

- **Academic Office:** After the “Edital” announcing the Jury has been published, the Academic Office contacts the members of the Jury, sending them the thesis, the candidate’s CV and a proposal regarding the main opponents, and asking their opinion. A response letter template is provided.

2

- **Jury:** Each member of the Jury assesses the thesis regarding its suitability to be discussed in a public event, and also expresses his/her agreement (or not) regarding the proposed main opponents.
- In case of unanimous acceptance, the process goes to step 3; otherwise to step 2a.

2a

- **Jury:** In case there is no unanimous agreement, a formal meeting is organized to discuss the thesis and decide which improvements to require from the candidate.
- A report with those recommendations is issued and the PhD student is given a period of time to make the changes (usually 3 months).

2b

- **PhD Student:** Makes the changes according to the recommendations of the Jury and resubmits the improved version (after getting the agreement of the supervisor) within the specified time limit.

3

- **Jury + PhD Student + PDEEC Secretariat:** The public event for thesis defense (“viva”) is scheduled. The event takes up to 3 hours.
- When scheduling the public event, and while trying to minimize the waiting time for the candidate, it is necessary to take into account the availability of the members of the Jury as well as the availability of the PhD defense room.

4

- **PhD Student:** After the PhD defense (and in case of success), the new doctor shall prepare and submit a final version of the thesis according to the requirements of UNL, and making any changes that might have been recommended during the defense.
- Request diploma.

**Duration:** Typically the student should expect a window of 1.5 to 3 months (in case the thesis is accepted for public defense without changes). In case changes are required, it will typically take around 6 months.

Tips to reduce this duration:

- As soon as the Jury is approved by the university, the Supervisor may (informally) send in advance an electronic copy of the thesis to the various members so that they can start assessing it even before the official contact from the Academic Office.
- During this period, the Supervisor can also informally check the availability of the members of the Jury (and also the availability of the PhD defense room) in order to make a pre-booking.
- After the members of the Jury are given a reasonable time to check the thesis, the Supervisor can informally interact with them to make sure that all of them send the response letter in the shortest possible time.

## **ANNEX**

### **Guidelines for the elaboration of PhD theses**

(Elaborated by the Scientific Committee of PDEEC)

## Guidelines for the elaboration of PhD theses

### 1. Legal context

The elaboration of a PhD thesis in Electrical and Computer Engineering needs to comply with the Portuguese legal framework, which is in line with the Bologna process. This framework establishes the requirements for awarding the PhD title:

<p><i>Dec.-Lei 74/2006, Art. 28º</i></p> <p>1—O grau de doutor é conferido aos que demonstrem:</p> <ol style="list-style-type: none"> <li>a. Capacidade de compreensão sistemática num domínio científico de estudo;</li> <li>b. Competências, aptidões e métodos de investigação associados a um domínio científico;</li> <li>c. Capacidade para conceber, projectar, adaptar e realizar uma investigação significativa respeitando as exigências impostas pelos padrões de qualidade e integridade académicas;</li> <li>d. Ter realizado um conjunto significativo de trabalhos de investigação original que tenha contribuído para o alargamento das fronteiras do conhecimento, parte do qual mereça a divulgação nacional ou internacional em publicações com comité de selecção;</li> <li>e. Ser capazes de analisar criticamente, avaliar e sintetizar ideias novas e complexas;</li> <li>f. Ser capazes de comunicar com os seus pares, a restante comunidade académica e a sociedade em geral sobre a área em que são especializados;</li> <li>g. Ser capazes de, numa sociedade baseada no conhecimento, promover, em contexto académico e ou profissional, o progresso tecnológico, social ou cultural.</li> </ol> <p>2—O grau de doutor é conferido num ramo do conhecimento ou numa sua especialidade.</p>	<p><i>(Free translation)</i></p> <p>1—The PhD degree is awarded to those candidates who demonstrate:</p> <ol style="list-style-type: none"> <li>a. The capacity for a systematic understanding of a scientific field;</li> <li>b. Competences, skills and research methods associated with a scientific field;</li> <li>c. Ability to conceive, design, adapt, and perform a significant research, respecting the academic levels of quality and integrity;</li> <li>d. To have done a significant amount of original research that has contributed to the expansion of the frontiers of knowledge, part of which merits national or international dissemination in peer reviewed publications ;</li> <li>e. To be able to critically analyze, evaluate and synthesize new and complex ideas;</li> <li>f. To be able to communicate with his/her peers, the academic community and society in general on the specialization area;</li> <li>g. To be able to promote, both in the academic and professional contexts, the technological, social or cultural progress under the framework of a knowledge-based society;</li> </ol> <p>2— The doctorate degree is conferred in a field of knowledge or in one of its specialization areas.</p>
---	---

Two modalities are allowed for the thesis:

- Elaboration of a dissertation
- Compilation of a set of relevant publications.

<p><i>Dec.-Lei 230/2009, Art. 31º</i></p> <p>1 — O ciclo de estudos conducente ao grau de doutor integra a <b>elaboração de uma tese original</b> especialmente elaborada para este fim, adequada à natureza do ramo de conhecimento ou da especialidade.</p> <p>2 — Em alternativa, em <b>condições de exigência equivalentes</b>, e tendo igualmente em consideração a natureza do ramo de conhecimento ou da especialidade, o ciclo de estudos conducente ao grau de doutor pode, nas condições previstas no regulamento de cada instituição de ensino superior, ser integrado:</p> <ol style="list-style-type: none"> <li>a) Pela <u>compilação, devidamente enquadrada, de um conjunto coerente e relevante de trabalhos de investigação</u>, já objecto de publicação em revistas com comités de selecção de reconhecido mérito internacional;</li> <li>b) ...</li> </ol>	<p><i>(Free translation)</i></p> <p>1 — The cycle of studies leading to a doctoral degree entails the preparation of an original thesis especially elaborated for this purpose, and appropriate to the branch of knowledge or specialization area.</p> <p>2 — Alternatively, in <b>equivalent demand conditions</b>, and also taking into account the nature of the branch of knowledge or specialization area, the cycle of studies leading to a doctoral degree can, in accordance with the regulations of each higher education institution, be composed of:</p> <ol style="list-style-type: none"> <li>a) A <u>properly framed compilation of a coherent and relevant set</u> of research, already subject of publication in journals with peer reviewing of internationally recognized merit;</li> <li>b) ...</li> </ol>
---	---

## 2. Recommended guidelines

### Modality 1: Elaboration of a dissertation

*When:* This is the recommended modality for the PhD theses in Electrical and Computer Engineering at FCT-UNL.

*Typical structure:* Although the specific structure of each thesis as well as the titles of each section shall be defined by the candidate, following the advice of his/her supervisor(s), and taking into account the specific nature of the performed work, a typical structure can include:

- Preliminaries  
[Abstract in Portuguese and English, Acknowledgements, Table of contents, List of Figures, List of Tables, Glossary, ...]
- Introduction  
[Motivation, Research question(s), Hypothesis(es), research method, Structure of the dissertation, etc.]
- Background information (optional)  
[An optional section, especially in the case of research of a multi-disciplinary nature, giving a brief overview of the other disciplinary area(s) to facilitate understanding of the thesis by experts in Electrical and Computer Engineering]
- Literature review  
[Comprehensive synthesis of the state of the art related to the thesis, showing a critical spirit, and identifying current gaps / limitations. A good number of recent references shall be included; in other words, the literature review should not only reflect the state of the art when the PhD program started. This section will show the capacity of systematic understanding, critical analysis and synthesis][Hint: this chapter should be equivalent to a substantial journal survey paper]
- Conceptual contribution  
[Formulation of concepts, definitions, theories; Elaboration of innovative frameworks, models, architectures]
- Experimental developments  
[High-level (cleaned up) description of the research experiment]
- Validation / Discussion  
[Section collecting (enough) evidence, using a proper (systematic) method, to validate the hypothesis(es); Organized argumentation to convince the other researchers about the validity of the thesis]
- Conclusions and future work  
[What is the strongest and most important statement that you can make from your work? set of recommendations (to overcome limitations) or directions for future research (maybe new directions opened by this work)]
- References
- Annexes (optional)  
[Only if necessary to convince the reader or help others replicate the experiments. E.g. Implementation details, Detailed experimental data, etc.]

*Size:* A typical size for an engineering thesis is between **150** and **200** pages.

*Language:* **English** is recommended, as it allows wider dissemination. Alternatively, **Portuguese** can be used.

*Requirements before submission:* In order to submit the dissertation, the candidate must have:

- Finished all courses of the PhD program.
- At least **1** article (as first author) in a peer-reviewed journal in the Science Citation Index, and some papers in relevant peer-reviewed and indexed conferences. Only published or definitely accepted articles can be considered.  
Materials from publications of the candidate can be reused in the preparation of the chapters of the dissertation.
- Submitted all annual progress reports.
- A positive endorsement by the Thesis Accompanying Committee, stating that the dissertation is ready for public defence.

## Modality 2: Compilation of a set of relevant publications

*When:* Although allowed, this modality is **not recommended** for a PhD in Electrical and Computer Engineering at FCT-UNL and shall only be used in exceptional cases. In any case, this modality shall never be taken as a less demanding option.

*Typical structure:* In order to organize a proper compilation of materials, the following structure is recommended:

- Preliminaries  
[Abstract in Portuguese and English, Acknowledgements, Table of contents, List of Figures, List of Tables, Glossary, ...]
- Introduction  
[Motivation, Research question(s), Hypotheses, research method, Structure of the dissertation]
- Background information (optional)  
[An optional section, especially in the case of research of a multi-disciplinary nature, giving a brief overview of the other disciplinary area(s), to facilitate understanding of the thesis by experts in Electrical and Computer Engineering]
- Summary of achievements  
[An extended summary ( $\geq 20$  pages) of the main innovative achievements]
- Literature review [including references] (conditional)  
[Comprehensive synthesis of the state of the art related to the thesis, showing a critical spirit, and identifying current gaps / limitations. A good number of recent references shall be included; in other words, the literature review should not only reflect the state of the art when the PhD program started. This section will show the capacity of systematic understanding, critical analysis and synthesis]  
[This section can be skipped in case the candidate has published a substantial journal article of the type “literature survey”]
- Navigation map  
[A brief and well organized map guiding the reader through the attached papers, identifying the original contributions in those publications]
- Collection of relevant journal articles  
[Journal articles already published or definitely accepted where the PhD contributions and their validation are detailed]
- Conclusions and future work  
[What is the strongest and most important statement that you can make from your work? set of recommendations (to overcome limitations) or directions for future research (maybe new directions opened by this work)]
- Annexes (optional)  
[Impact of published works, e.g. citations to the included publications, number of downloads, etc.]

*Language:* **English** is recommended, as it allows wider dissemination. Alternatively, **Portuguese** can be used.

*Requirements before submission:* In order to submit the compilation/dissertation, the candidate must have:

- Finished all courses of the PhD program.
- **At least 3 articles** (as first author) of substantial size (typically  $\geq 16$  pages each) in relevant peer-reviewed journals in the Science Citation Index, and several papers in relevant peer-reviewed and indexed conferences. Only published or definitely accepted articles can be included.  
Small journal articles will not count for the above number.  
In case the chapter on Literature Review is not included, then **1 additional** journal survey article ( $\geq 16$  pages) [with the candidate as 1<sup>st</sup> author] is needed.
- Submitted all annual progress reports.
- A positive endorsement by the Thesis Accompanying Committee, stating that the dissertation is ready for public defence.