



# DOCTORAL TRAINING IN THE FACULTY OF TECHNOLOGY

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## 2 Overview

This document regulates and describes the scientific postgraduate education offered in the Faculty of Technology at the University of Turku. The contents of this document apply to all students pursuing postgraduate degrees in the Faculty.

### Decision making and preparatory work

Decisions regarding postgraduate education in the Faculty are prepared by Chief Academic Officer together with the Vice Dean and the Workgroup for Educational Development. The workgroup is led by the Vice Dean and consists of representatives of the Faculty's departments, doctoral researchers, and the doctoral programmes representing the disciplines of the Faculty. Preparatory work is conducted in conjunction with the Faculty's departments and the steering committees of the doctoral programmes.

Decisions regarding postgraduate education are made by Deans and the Faculty Council. The Faculty Council grants permissions for the public defence of the thesis and grades both doctoral and licentiate theses.

Each doctoral programme has a director and a steering committee in which there are professor, university lecturer/teacher, and doctoral researcher level representatives from the departments represented in the doctoral programme.

## 3 Degrees and Fields of Research

The Faculty of Technology at the University of Turku offers postgraduate degrees in technology and natural sciences. Moreover, it is possible to complete a postgraduate degree in humanities in the field of Phonetics. The postgraduate degrees in technology are *Licentiate of Science (Technology)* and *Doctor of Science (Technology)*. The postgraduate degrees in natural sciences and humanities are *Licentiate of Philosophy* and *Doctor of Philosophy*. Most postgraduate students complete a doctoral degree directly after their Master's degree. The licentiate degree is primarily intended for professional accreditation.

The Faculty offers postgraduate degrees in the following disciplines and their focused research fields:

### NATURAL SCIENCES (Doctor of Philosophy and Licentiate of Philosophy)

#### BIOSCIENCES

- Biochemistry
- Molecular Biotechnology and Diagnostics
- Food Chemistry
- Molecular Plant Biology

#### COMPUTER SCIENCES

- Computer Science



## TECHNOLOGY (Doctor of Science (Technology) and Licentiate of Science (Technology))

### AUTOMATION AND ELECTRICAL ENGINEERING

- Automation and Electrical Engineering

### BIOTECHNOLOGY

- Biotechnology
- Food Development
- Sustainable Biotechnological Processes

### INDUSTRIAL ENGINEERING AND MANAGEMENT (also Doctor of Philosophy degree)

- Industrial Engineering and Management

### INFORMATION AND COMMUNICATION TECHNOLOGY

- Information and Communication Technology

### MATERIALS ENGINEERING

- Materials Engineering

### MECHANICAL ENGINEERING

- Mechanical Engineering

## HUMANITIES (Doctor of Philosophy and Licentiate of Philosophy)

### COMMUNICATION SCIENCES

- Phonetics

## 4 Admission

### 4.1 Eligibility for admission

Eligible for postgraduate studies are persons who have completed (Section 37 of the Universities Act 558/2009):

1. a relevant Master's degree awarded by a university;
2. a relevant Master's degree awarded by a university of applied sciences; or
3. a relevant applicable study programme abroad which in the awarding country gives eligibility for a corresponding level of higher education.

The University may require a student admitted to study for an academic or artistic licentiate or doctoral degree to complete necessary supplementary studies in order to acquire the knowledge and skills needed in the study programme.

### 4.2 Admission criteria

Applicants are selected on the basis of the information provided in the application and its appendices. Admitted postgraduate students are required to have been successful in their prior studies. If the field of the Master's degree differs from the field of research of postgraduate studies or there are other shortcomings in prior studies, knowledge and skills may be required to be supplemented to achieve a sufficient level. The appointed research director of a postgraduate student gives a



statement on the possible need for so-called bridging studies. Admission is also dependent on the proposed research topic fitting the Faculty's and its departments' fields of research and the Faculty having the necessary resources for teaching and supervision available.

Doctoral researchers are required to have a good command of the English language, which has to, according to Rector's decision, be proven in certain cases with a language test.

## 4.3 Applying

Admissions to doctoral training are conducted according to the University of Turku Regulation on Studies during the application times defined by the Graduate School.

Required appendices of the application form for a postgraduate study right are:

- A degree certificate and the relevant transcript of the studies which prove the eligibility of the applicant
- A research plan
- An account of the planned funding and schedule of the studies
- A supervision plan naming supervisor(s), research director and a possible thesis follow-up group for doctoral training

Doctoral programmes may also require other attachments to be included in their applications. Additional information about applying to doctoral studies can be found on the websites of the doctoral programmes as well as in application announcements, which are published before the application periods.

The right to study for a licentiate degree is applied for by submitting an application to the Faculty of Technology. The application period is continuous. The appendices specified in the postgraduate studies application (see above) as well as a motivation letter must be attached to the application.

The University of Turku checks the validity of those degrees based on which a right to postgraduate studies is applied for.

## 4.4 Decision

The doctoral programme makes a proposal for admitting doctoral degree study rights in the Faculty. The decision on admission to postgraduate studies is made by the Dean responsible for the Faculty's postgraduate education after hearing the departments. The student admission decision in the Faculty is prepared by Chief Academic Officer.

# 5 Supervision and Responsibilities of Different Parties

## 5.1 Supervisors of postgraduate students

The Faculty of Technology follows the current Rector's decision on supervising postgraduate studies when appointing supervisors for postgraduate students. One of the doctoral researcher's supervisors has to be employed by the University of Turku or be docent of the University of Turku.



The Faculty may change the appointed supervisor if requested by the student, supervisor or research director. The Faculty appoints doctoral researcher's supervisors based on a proposal made by the doctoral programme in question. In licentiate studies, the proposal is made by the department whose field of research the degree belongs in.

The duties of the supervisor are, among others:

- to direct the student in planning and completing postgraduate studies;
- to direct the student in planning and completing research and completing the thesis;
- to follow the progress of research and postgraduate studies in accordance with the supervision plan;
- to accept an annual update of a personal study plan, if needed;
- to assist the student in making contact with other researchers in the field and with users of the research;
- a principal supervisor has to give a statement on the activeness of a postgraduate student in connection with student's annual progress reporting;
- to assist the student in applying for funding by providing information on available options;
- to assist in career planning by having an annual discussion on the subject;
- to ensure that a thesis written in a second language undergoes a language check if needed;
- to be responsible for checking the originality of the thesis with the plagiarism detection system.

## 5.2 Research director of postgraduate studies

On admission to the Faculty, postgraduate students are appointed a research director. The Faculty appoints the research director based on the proposal made by the department which is responsible for the research field in question. A person eligible for research director is an employee of the Faculty whose title is Professor. In an exceptional case where there is no Professor available, an Associate Professor can be appointed as research director.

A Professor may continue as research director after he/she has retired. However, a Professor Emeritus/-ita cannot be appointed as research director.

The research director may also be one of the supervisors. If this is the case, the student must also have at least one other supervisor or a thesis follow-up group.

The duties of the research director are:

- to monitor the progress of research work and postgraduate studies annually in collaboration with the supervisor;
- to assume responsibility for the scientific level of the degree;
- to ensure that necessary conditions for the studies are maintained;
- to accept the first personal study plan of a postgraduate student and the application for the final grade of the postgraduate studies module. The research director ensures that the required learning outcomes of postgraduate studies are achieved with the completed postgraduate studies and thesis work.
- to ensure that the thesis as a whole meets the requirements regarding the extent of a doctoral thesis;
- to make a proposal for the examiners of a licentiate thesis or the pre-examiners, opponent and chairperson (custos) of a doctoral thesis;
- to provide the Faculty with a statement approved by the supervisor, research director and student indicating the author's contribution to the research if the thesis contains joint publications. The



statement must also say whether a part of the thesis has previously been used in another thesis or if such use is being planned;

- to ensure that the intended final version of a licentiate or doctoral thesis is delivered to the Faculty at the same time as the proposal for pre-examiners;
- to ensure that the intended final version of a licentiate or doctoral thesis is delivered to the examiners by the student, supervisor or research director immediately after their appointment
- to ensure that a doctoral thesis is delivered to the opponent by the student, supervisor or research director immediately after the opponent has been appointed;
- to help solve possible cases of disagreement in supervision

## 5.3 Responsibilities of postgraduate students

The postgraduate student has the primary responsibility for the progress of his/her studies. The responsibilities of the postgraduate student are defined as follows:

- the student carefully prepares for meetings and follows the agreed schedule;
  - the student completes postgraduate studies independently with the supervisor's support;
  - the student annually participates in the agreed number of postgraduate courses and ensures that they are appropriately registered;
  - the student is responsible for the progress of his/her research work and for informing the supervisor and the doctoral programme on the progress made according to the agreed reporting schedule and in the agreed manner;
  - the student informs the supervisor and the research director (+ possible follow-up group) of all changes that considerably affect working conditions, progress of the thesis project or keeping with the agreed schedule;
  - The doctoral researcher hands in an annual follow-up report to the doctoral programme. The licentiate student hands in an annual follow-up report according to the instructions of the Faculty.
- Postgraduate students must register with the University each academic year. Registration is dependent on the Faculty granting the student the right to pursue postgraduate studies. All postgraduate students of the Faculty must register regardless of the institution or organisation in which they study. Only postgraduate students who have registered with the University as an attending student can complete postgraduate studies and advance completing their degree.

## 6 Supervision Plan

The student, the supervisor, and the research director make a supervision plan on the application form, determining the responsibilities and duties of each party, and their commitment to the cooperation.

Doctoral students can have a thesis follow-up group who are acquainted with the subject matter. The thesis follow-up group convenes at least once a year on the student's initiative. The student must prepare well for thesis follow-up group meetings to be able to present his or her research and its progress to the group.

A supervision plan is made when a person applies for a postgraduate study right in the Faculty. The plan will be updated if a supervisor(s), research director or a member of the follow-up group needs to be changed. The supervision plan expires if a student is moved to the passive register.



The supervision plan is signed by the postgraduate student, all supervisors and the research director. If the research director is changed, the opinion of the head of the department will be asked. The director of the doctoral programme will process the supervision plans of doctoral researchers. The supervision plan is accepted by the Dean responsible for postgraduate education.

## 6.1 Changing the major subject of the degree

The doctoral researcher may apply for changing their major within the doctoral programme from the Faculty. Accepting the application requires the approval of all supervisors, the research director, and the doctoral programme. If upon changing majors, there should also be changes to supervisors, the supervision plan and if necessary, the research plan, must also be updated. Changing majors may also require changing research director. The Faculty may ask the research director to state on a possible need for bridging studies. The Faculty decides the change of the major subject.

If changing majors requires changing doctoral programme, the doctoral researcher has to apply for a study right in that doctoral programme during the regular application period.

## 7 Postgraduate Studies

Postgraduate degrees in the Faculty contain 40 credits of postgraduate studies. The credits must form a coherent whole supporting studies and research work in the research field and should prepare the student for carrying out research and other demanding specialist tasks. The structure of the studies is defined in the curriculum of the Faculty and the doctoral programmes (study guide).

The doctoral researcher draws up a personal study plan no later than six months after beginning doctoral training. The doctoral programme coordinator reviews the plan, which then will be accepted by the research director.

It is possible for the doctoral researcher to update the plan annually. An updated plan is reviewed by the doctoral programme coordinators and the updated plan is accepted by the principal supervisor.

Postgraduate students who have begun their studies before 1 August 2018 are allowed to complete postgraduate studies in accordance with the old study requirements of the Faculty (60 ECTS) until 31 July 2024. Doctoral researchers who have started their studies in the DPMLS, MATTI or PCS doctoral programmes before 1 January 2022 may complete their degree according to the curricula of period 2020-2022 of the DPMLS, MATTI or PCS doctoral programme until 31 December 2026. Starting from 1 August 2024, all postgraduate degrees follow the requirements of 40 credits for postgraduate studies. A postgraduate student may complete 40 credits of postgraduate studies in accordance with the degree requirements that were in operation at the time their postgraduate study rights began or have taken effect thereafter, noticing the restrictions set above.



Research ethics is a mandatory requirement for postgraduate students who have started their studies on or after 1 August 2016 and also for all those completing their studies in accordance with the 40 credit requirements.

Postgraduate studies may not contain studies already included in the Master's degree; this applies to those who have completed their Master's degree after 1 August 2009.

## 7.1 Completing courses at other Finnish universities

Postgraduate students may complete such courses at other Finnish universities that are relevant to their field of research if corresponding courses are unavailable at the University of Turku. Completing a course requires applying for a flexible study right. Accepting an application for a flexible study right requires that the course in question is included in the postgraduate student's accepted personal study plan the size of which is the minimum acceptable number of ECTS. A prerequisite for including a course in a personal study plan does not apply to studies at Åbo Akademi University which, however, also require a flexible study right.

## 8 Pursuing a Doctor of Science (Technology) or a Doctor of Philosophy degree

To attain DSc (Tech) or a PhD degree, doctoral researchers must:

- 1) Complete a total of 40 credits of studies specified in the postgraduate study plan.
- 2) Complete and publish a doctoral thesis accepted by the Faculty after a public examination.

The thesis may be in the form of either a monograph or a compilation of several scientific articles including a summary of the publications (detailing the objectives, methods, and outcomes of the research as well as a discussion). The thesis may also contain manuscripts intended for publication, provided that at least one of the articles has been approved for publication in a peer-reviewed publication series. If the thesis consists of joint publications, the student's independent contribution to the shared article(s) is detailed in a separate clarification.

Before making a proposal for examiners, the research director must ensure that the thesis is of the required extent and that the manuscript delivered for pre-examination fulfils the formal requirements for a doctoral thesis.

The thesis may also contain one or more patent applications, which when evaluating the scope of the dissertation are equated to an unpublished scientific publication manuscript. At most one patent application will be taken into account when assessing whether a thesis meets the minimum size required for it; the patent application must be public. The use of a patent application in a thesis requires the consent of the patent owner and of all those with inventor status. The results presented in the patent application must differ significantly from those presented in the other publications of the thesis.

The aim is that the doctoral degree can be completed in four years of full-time studying after having achieved the Master's degree.



## 9 Pursuing a Licentiate of Science (Technology) or a Licentiate of Philosophy degree

To attain a LicPhil or LicSci (Tech) degree, students must:

- 1) Complete a total of 40 credits of studies specified in the postgraduate study plan.
- 2) Complete a licentiate thesis which is accepted by the Faculty Council.

The thesis may be a monograph or a compilation of several scientific publications including a summary of the publications (detailing the objectives, methods, and outcomes of the research as well as a discussion). The publications may be collaborative, in which case the student's independent contribution is detailed in a separate clarification. The licentiate thesis may also contain manuscripts intended for publication.

The aim is that the licentiate degree can be completed in two and a half years of full-time studying after having completed a Master's degree.

## 10 Examination of the Doctoral Thesis and Permission to Defend a Dissertation

### 10.1 Permission to submit the manuscript of the doctoral thesis to pre-examination

The Dean authorizes the doctoral researcher to submit the manuscript of the dissertation to pre-examination, while appointing pre-examiners for the thesis. To obtain this permission, the doctoral researcher must submit the manuscript of the dissertation to the Faculty. The thesis must be checked with a plagiarism detection program. In the case of a compilation thesis or a monograph based on articles, the following attachments must be submitted together with the manuscript:

- Contribution statement. A statement approved and signed by all supervisors, the research director and the doctoral researcher indicating the author's contribution to the research if the thesis contains joint publications. The statement is required if the dissertation manuscript contains publications with more than one author. If an article in a compilation thesis has been or is going to be used in another thesis, then a clarification of both doctoral researchers' contribution to the article must be clarified in the contribution statement.
- Should the thesis contain an unpublished manuscript, the doctoral researcher needs to acquire a permission to use it in the thesis from every author of the manuscript.

If necessary, the Dean may ask the opinion of the steering committee members (who have a doctoral degree) of the doctoral programme on whether the manuscript of the dissertation is ready for pre-examination.

### 10.2 Pre-examiners, opponent and custos

The Dean appoints at least two pre-examiners and one or two opponents ('examiners' onwards) for the doctoral thesis based on the proposal made by the research director. The examiners should be



docents or have equivalent scientific merits. They should be external in relation to the doctoral thesis work. They should be external in relation to the doctoral thesis work, they must not have co-authored publications together with the author of the doctoral thesis. Examiners must not have active and close scientific collaboration with the doctoral researcher's supervisors. Such collaboration includes, for example, joint publications or joint projects over the last three years. Examiners must come from outside the University of Turku and the examiners should represent different organisations. For a justified reason, one of the examiners may be a docent of the University of Turku, if his/her regular post is elsewhere. In addition, an examiner must not be associated with the author of the thesis as described in Section 28 of the Administrative Procedure Act (434/2003), nor must they be in such dispute or other relationship, which compromises his/her impartiality.

Neither the supervisor, the research director, the co-authors of any collaborative publications in the thesis, nor members of the thesis follow-up group may act as examiners. A pre-examiner may not act as an opponent.

The Dean appoints a custos for the public examination on the basis of the research director's proposal. The custos is an esteemed scientist responsible for the appropriate procedure of the public examination. Suitable persons for custos are primarily professors of the Faculty. Should there not be one available, an Associate/Assistant Professor or a docent can be appointed if adequately justified. The custos must be an employee of the University (or Professor Emeritus/-ita). The custos reports to the Faculty as to whether the correct protocol was followed during the public examination. The custos does not take part in the grading of the doctoral thesis.

In any deviation from these instructions, the research director must give written grounds for his or her proposal.

## 10.3 Permission for the defence of dissertation

The Faculty Council grants the permission for the defence of the thesis at a public examination on the basis of the pre-examiners' statements. The council can delegate the decision to the Dean. Getting a permission for the defence requires that:

- The Faculty has received the pre-examiners' reports both of which recommend granting the permission.
- If a pre-examiner has suggested corrections to the manuscript and if they have requested that either they or the supervisor verifies that the corrections are made, then this needs to happen in the manner chosen by the pre-examiner. In this case, a statement from the supervisor/research director is required, which clarifies what corrections have been made to the manuscript.
- The doctoral researcher has emailed his/her comments on the statements or lack thereof to the Faculty or at least 14 days have passed since the pre-examiners' statements were delivered to the doctoral researcher.
- The doctoral researcher has completed all studies to be included in the doctoral degree. The research director has accepted the doctoral researcher's doctoral studies module (40/60 ECTS).
- As per Rector's decision, only dissertations which contain an abstract in both Finnish and English may be granted a permission for the defence in the Faculty.



## 10.4 Informing about the appointments

Prior to the selection of the examiners, the doctoral researcher is given an opportunity to state his or her opinion on the matter.

The Faculty sends the examiners and the custos information on the appointment, instructions, and a possible contribution statement, as well as a clarification if a publication included in the manuscript of the dissertation is used or is planned to be used in another dissertation.

## 10.5 Examiners' statements and doctoral researcher's response

The pre-examiners of a doctoral thesis must provide their statement on the thesis within one month of being appointed and notified. The opponent(s) must provide their statement within two weeks after the public defence. The examiners must give separate statements. If the statement is delayed, the Faculty will contact the examiners or opponents if needed.

Prior to granting a permission to defend the dissertation, the doctoral researcher is given the opportunity to respond to the reviewers' statements. The doctoral researcher may also respond to the opponent's statement prior to the grading of the doctoral thesis.

## 10.6 Processing negative statements

Should a pre-examiner of a doctoral thesis propose rejecting the dissertation, the research director and the steering committee of the doctoral programme address the matter and prepare a proposal for further measures to the Faculty Council. The doctoral researcher will be given an opportunity to write an appeal.

# 11 Examination of a Licentiate Thesis

The Dean appoints at least two examiners for a licentiate thesis based on the proposal of the research director. One of the examiners must represent the department in which the research field in question belongs. One examiner should come from outside the University of Turku and his/her appointment follows the same principles as the appointment of dissertation examiners (see 10.2). The examiners should be docents or have equivalent scientific merits. Prior to the appointment of examiners for a licentiate thesis, the author of the thesis is allowed to make a statement on the matter.

The Dean grants the licentiate student a permission to send the licentiate thesis to examination. An originality check is a prerequisite for getting the permission. If a licentiate thesis contains co-authored publications, attachments specified in section 9.1 must be delivered.

The Faculty notifies the examiners of the appointment and sends instructions as well as a possible clarification on the co-authored publications.



The examiners must give separate statements within one month of being appointed. If a statement is delayed, the Faculty will contact the examiner.

Prior to grading the licentiate thesis, the author of the thesis is given the opportunity to respond to the examiners' statements.

## 12 Grading of Doctoral and Licentiate Theses

The Faculty Council decides accepting doctoral and licentiate theses. Doctoral theses are graded as "accepted with honours", "accepted" or "rejected". Grading is based on the statements of the official examiners. If all examiners estimate in their statements that a doctoral thesis is on the same level as the top 10% of theses in its field internationally, the thesis can be accepted with honours.

Licentiate theses are graded as "accepted" or "rejected". The Faculty will either accept or reject the licentiate thesis based on the examiners' statements.

### 12.1 Grading criteria

At least the following aspects must be considered when grading a doctoral thesis and, where applicable, a licentiate thesis:

- the significance, originality or novelty of the research setting in relation to other completed and ongoing research in the field in question;
- the justifiability of the chosen research methods, the originality of the methodology and the development of new methods;
- the quality, impact and theoretical or practical significance of the research results;
- proof of familiarity with the research field in question and the doctoral researcher's ability to critically examine his or her own and other research;
- the coherence, clarity, and other issues concerning the style of the presentation; and
- the ability of the author to defend the research in a public examination.

### 12.2 Rectification of grades

Candidates may make a request for the rectification/correction of their doctoral or licentiate thesis grade to the Faculty Council within 14 days of receiving the grade.

## 13 Degree Certificate

A degree certificate is issued immediately after the acceptance of the doctoral thesis or a licentiate thesis without having to apply for the degree certificate separately.

The field of education, the major subject, and the title of a licentiate or doctoral thesis are mentioned in the certificate. The degree certificate is issued both in Finnish and in English.



## 14 Monitoring Activeness and the Passive Register

The activeness of doctoral researchers is monitored annually as specified in the University of Turku Regulation on Studies. Doctoral programmes take care of practical arrangements regarding annual progress monitoring. The Faculty is responsible for practical arrangements regarding annual progress monitoring of licentiate students.

The supervisor of a doctoral researcher states on the doctoral researcher's activeness.

If there is no progress in the doctoral researcher's studies and s/he does not actively advance his/her research, the study right may be moved to the passive register. The supervision plan is considered void, if the doctoral researcher is moved to the passive register.

In order to be moved out from the passive register, the doctoral researcher must deliver an application for re-activation of the study right along with updated supervision and research plans. As part of the supervision plan, the study plan is also updated. An updated supervision plan is drafted based on the contemporary degree requirements. In the research plan, the current phase of the thesis work, the schedule, and the required actions needed to complete the degree must be described.

In conjunction with the application for re-activation of study right, the supervision plan is processed as an update to a supervision plan.