Supervision, research and dissertation

Quality requirements and forms of dissertation

Doctoral degree

Extent of the doctoral dissertation

The goal is for the doctoral candidates to complete their degree in four years of full-time study, during which they complete the required doctoral studies and write a doctoral dissertation to be examined in a public examination of a doctoral dissertation. For this goal to be feasible, the workload of the degree shall be proportionate to the objective duration of studies. This shall be taken into account in the course of the supervision of the doctoral candidate.

The doctoral degree, including a doctoral dissertation, should be completed in four years of full-time study. This is the goal of Aalto University. During this time the student completes the required studies and write a doctoral dissertation, which is examined publicly. The workload of the degree should be proportionate to this goal and this should be borne in mind in the course of the supervision process.

To be awarded a doctoral degree, students shall

1. complete either a degree of Licentiate of Science in Technology or theoretical studies (40 ECTS)
2. demonstrate independent and critical thinking in relation to their field of research, as well as
3. produce a doctoral dissertation and defend it in public. A doctoral dissertation shall contribute to new scientific knowledge.

General quality requirements for doctoral dissertations

- A doctoral dissertation shall contain new scientific knowledge in the field it represents. In the field of art and design, the doctoral dissertation may also contain new methods of artistic creation or products or transactions, which fulfill high artistic demands.
- The doctoral dissertation must present the new results clearly and in a manner which meets the criteria set for scientific texts.
- The independent contribution to the research or artistic production shall be sufficient and clearly demonstrable.
- The research methods used shall fulfill the criteria set for scientific or art-based research.
- A doctoral dissertation shall conform to the principles of responsible conduct of research and adhere to ethically sustainable principles.

Formats and contents of the doctoral dissertation

Schools may approve doctoral dissertations in the forms described below. Schools take the decision on the acceptable formats of dissertations in the school and give further guidelines on the requirements for doctoral dissertations as needed.

In the field of art and design, a doctoral dissertation may also include other products than written products.

1. A single research piece or a monograph

A monograph is a coherent writing based on the work of the doctoral candidate and written by the candidate. The monograph may contain references to previous works by the doctoral candidate on the same topic.

The doctoral dissertation describes the research problem, the research goals, the used methods and results, and presents a summary of the key findings. The summary shall assess the significance of the study for the discipline.

2. An article-based doctoral dissertation

An article-based doctoral dissertation consists of a set of publications on a related set of problems, and a summary of the findings. The research plan is to be made in a way that makes it possible to complete the doctoral degree in four years of full-time study.

The articles included in the doctoral dissertation are published or submitted for publication in an acknowledged peer-reviewed forum in the discipline (for example a scientific publication series, conference proceedings or other work). Articles not yet accepted for publication can also be included in the doctoral dissertation. The number of publications required for the dissertation depends on their extent, scientific significance and quality as well as on the weight of the independent contribution of the doctoral candidate to the publications.

The articles may also include co-authored publications if the author's independent contribution to them can be demonstrated. An article can be included in several dissertations if the separate contribution of the doctoral candidate can be demonstrated. In the field of art and design, a doctoral dissertation may also include joint productions if the doctoral candidate has made an independent contribution to them.

The summary of the article-based doctoral dissertation is an independent entity, which provides an overview of the dissertation contents. The summary shall describe the research problem, research goals and methods, and presents a summary of the key findings. The summary shall assess the significance of the study for the discipline. The summary shall contain a list of the publications included in the thesis and describe the independent contribution of the candidate in each publication separately.

3. Essay-based doctoral dissertation
An essay-based doctoral dissertation consists of scientific essays and a summary. The essays and the summary shall deal with a single research problem or set of problems so that, when viewed as a whole, the independent contribution of the author meets the requirements set for a doctoral dissertation.

When planning the set of essays one has to bear in mind that it has to be possible to complete the doctoral degree in four years of full-time study. Each of the essays shall contain new results and viewpoints, and shall primarily be based on independent research by the author, but also collaboratively written essays may be accepted as part of the doctoral dissertation if the independent contribution of the author may be clearly demonstrated.

The number of essays required depends on their extent, scientific significance and quality as well as on the weight of the independent contribution of the author to the essays.

The summary describes the research problem, research goals and methods, and presents a summary of the key findings. The summary shall assess the significance of the study for the discipline. The summary contains a description of the independent contribution of the author in each of the essays.

4. Other works meeting corresponding scientific criteria

- At its discretion, the school may also approve as a doctoral dissertation some other work meeting corresponding scientific criteria.

Open access to the doctoral dissertation and to the articles included in it

The doctoral dissertations of Aalto University are published in compliance with the Aalto University open access principles:

http://libguides.aalto.fi/content.php?pid=624816&sid=5317294

Open access to doctoral dissertations is made possible by the authors depositing their work in the open access repository maintained by Aalto, Aaltodoc: https://aaltodoc.aalto.fi/handle/123456789/5.

Other guidelines

The Schools may issue further guidelines on doctoral dissertations.

Dissertation

Approved doctoral dissertation at the School of Engineering may be

- a single study (a monograph) or
- article-based doctoral dissertation

Examining the dissertation is the responsibility of two preliminary examiners. The doctoral programme Committee shall supervise the examination.

In an article dissertation, the articles have already undergone peer review. The examination is then usually directed at the summary part and the aggregate of the dissertation, as well as the doctoral student's own contribution. The summary must contain an account of the subject studied, the most important research results obtained by the author, discussion of results, and a list of the aforementioned separate publications, and it must supplement these publications to fulfil the requirements above. The separate publications are generally so-called co-authored publications, from which it is not necessarily clear, which is each author's contribution to the publication. In such a case, a sufficiently detailed report of the contributions of all authors in the separate publications must be included in the summary.

A doctoral dissertation is a public document and shall be available 10 days before the defence at the School of Engineering's office noticeboard in Otakaari 4.

Guidelines by the Doctoral Programme Committee of the School of Engineering

Formats of doctoral dissertation at ENG

The formats of doctoral dissertations at the School of Engineering are

1. A single research piece or a monograph
2. Article-based doctoral dissertation

Further guidelines on requirements of doctoral dissertation at ENG

The articles included in the article-based doctoral dissertation are published or submitted for publication in a peer-reviewed forum in the discipline. Peer-reviewed forum may be a scientific publication series (journal), conference proceedings, or book chapter.

One article not yet accepted for publication (under review in a journal) can be included in the article-based doctoral dissertation.

The number of publications required for the dissertation depends on their publication forum, extent, scientific significance and quality as well as on the weight of the independent contribution of the doctoral candidate to the publications.

General quality requirements for doctoral dissertations
The writer of a dissertation shall pay special attention to, i.a., the following things:

- A doctoral dissertation shall contain new knowledge in the field it represents.
- The doctoral dissertation must present the new results clearly and in a manner meeting the criteria set for scientific texts.
- The independent contribution to the research or artistic production shall be sufficient and clearly demonstrable.
- The research methods used shall fulfill the criteria set for scientific research.
- A doctoral dissertation shall conform to the principles of responsible conduct of research and adhere to ethically sustainable principles.

### Good scientific practice and handling violations thereof


A publication by the Finnish Advisory Board on Research Integrity: Responsible conduct of research and procedures for handling allegations of misconduct in Finland

### Supervision

The School appoints to each doctoral student a supervisor and a thesis advisor. Their role is significant in starting the studies and research as well as in the final phases. They support and encourage the student, help with financing arrangements and also contribute to the student’s career planning.

The supervising professor is in charge of the student’s studies and research in their entirety. S/he should see to that the general arrangements for successful studies and research are adequate.

The supervisor may delegate to the thesis advisor some of the duties listed below, or act himself/herself as a thesis advisor. S/he negotiates with the supervisor/s about the division of work in the supervisory process. The duties are agreed upon in the student’s supervision plan.

The student may have several thesis advisors at different stages of the research, eg, if the chosen methodology requires external expertise. In some research fields of the School, a supervisory committee may be appointed, with members from the student’s own School or from exterior organisations.

#### Roles of the supervising professor and thesis advisor

The supervising professor is responsible for the supervision of the doctoral student and ensures that the student is aware of the requirements of a doctoral dissertation and of the stages included in the preliminary examination and public defense processes. S/he provides guidance in the execution of the research and instructs the doctoral candidate in critical and independent thinking in research and artistic activities.

The supervising professor encourages the doctoral candidate to actively publish his/her research results in the publication forums of the field of research and guide him/her in publication writing.

The supervisor supports the implementation of the financing plan.

Participation in teaching is part of doctoral training and as such obligatory for full-time doctoral candidates. However, the supervising professor ensures that full-time doctoral candidates are not burdened excessively with duties other than doctoral research work.

The supervising professor goes through the personal study plan of the doctoral candidate, which includes a plan of executing the research work. In addition, the supervising professor follows up on the progress of the studies and that of the research work on a regular basis: the supervising professor and the student discuss the progress of the studies on a regular basis, and the personal study plan is updated accordingly as necessary. At minimum, the plan is checked once a year. This follow-up requirement concerns full-time and part-time doctoral candidates.

The supervising professor ensures that the doctoral candidate is aware of good scientific practice and the ethical principles followed in his/her field of research as well as of the regulations concerning immaterial property rights, and monitors that the candidate adheres to such principles.

To this end, the supervising professor and the doctoral candidate have a discussion at the start of the supervision relationship in order to look into the questions of research ethics and related practices relevant to the work of the candidate.

When the dissertation manuscript of the doctoral dissertation is complete, it may only be submitted for preliminary examination after the supervising professor has issued a statement confirming that the manuscript is ready for preliminary examination. The supervising professor makes sure that the doctoral candidate makes the necessary corrections proposed to the doctoral dissertation manuscript by the preliminary examiner.

The supervising professor assists the doctoral candidate in career planning, and ensures that the doctoral studies and research process equip him/her with not only research skills but also transferable skills.

#### The doctoral student’s role

Beginning the doctoral studies means committing oneself to long-term and goal-oriented study and research. The doctoral candidate has a right to study in accordance with the personal study plan and to receive knowledgeable guidance in his/her studies on a regular basis.

In return for such guidance, the doctoral candidate commits himself/herself to studying in accordance with the confirmed study plan and the associated research proposal. Eligibility for supervision also requires enrolling as an attending student at the university. In addition, the doctoral candidate commits to acting in compliance with the guidelines of the National Advisory Board on Research Ethics on good scientific practice.

What we expect from the doctoral student:
Students prepare a personal study plan including at least the theoretical studies and a plan of the execution of the research. Also the supervision practices are agreed upon at the start of the doctoral studies: the supervising professor, thesis advisor(s) and the doctoral candidate make a written supervision agreement where they agree on the responsibilities, rights and obligations of each party involved in the doctoral training process. The supervision agreement shall be updated as necessary.

In addition, the student is expected to:

- Provide teaching related to the research field and to communicate the results of his/her research to others;
- Aim at, together with the supervising professor, securing funding for the doctoral studies;
- Report on the progress of the research to the supervising professor on a regular basis;
- Notify the supervising professor of any changes necessary to the study plan, or of any problems with following the plan and
- Annually enroll at the university.