



Aalto University  
School of Engineering

# Doctoral studies and thesis

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# Doctoral Programme Committee

**Harri Koivusalo (BE), chair**

- Professor, Water Resources Engineering

**Risto Lahdelma (ME), vice-chair**

- Professor, Energy Systems for Communities, mathematical modelling and optimization

**Seppo Junnila (BE)**

- Professor, Real Estate Business

**Marketta Kyttä (BE)**

- Professor, Land Use Planning

**Jussi Leveinen (CIVE)**

- Professor, geological engineering

**Tuukka Mustapää (ENG)**

- Student representative



# Doctoral programme

See also

<https://into.aalto.fi/display/endoctoraleng/Engineering>

## Programme services

### Planning officer

**Ritva Viero**

room 233, Tietotie 1 E  
tel. +358 50 597 0610

### Coordinator, Study Affairs

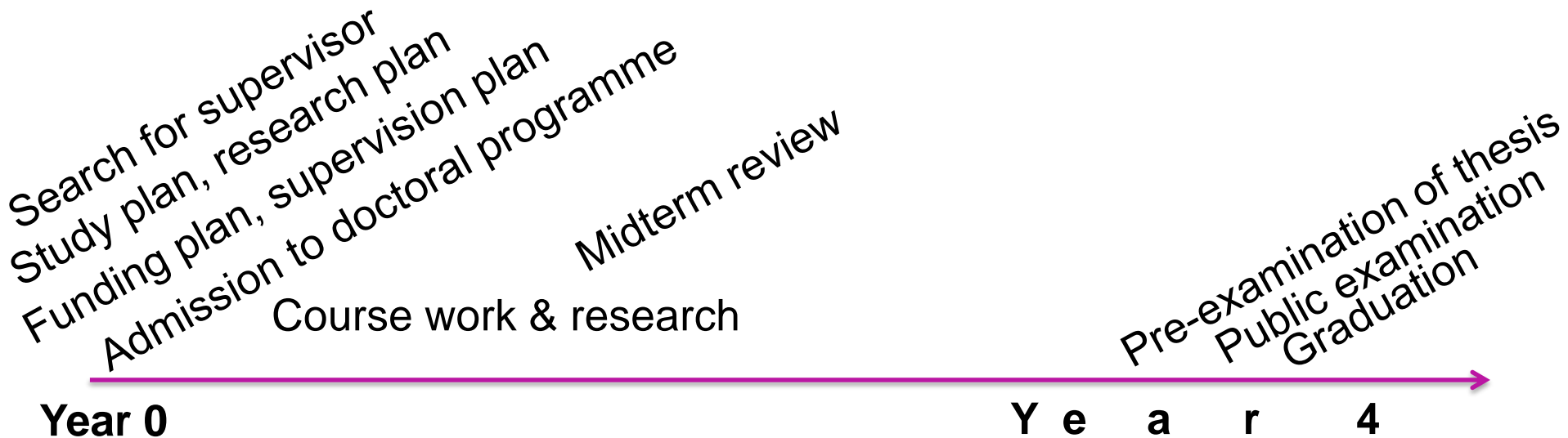
**Reetta Mannola**

room 233, Tietotie 1 E  
tel. +358 50 373 7702



Offices

# Doctoral studies - process



## Tasks of the Doctoral Programme Committee

- Prepare admission decision
- Develop course contents
- Approve thesis subjects
- Confirm study plans
- Appoint preliminary examiners
- Grant permission to print theses
- Grade doctoral theses

# Student–advisor(s)–supervisor - team

See also  
<https://into.aalto.fi/display/endoctoraleng/For+supervising+professors+and+thesis+advisors>

## Supervisor's responsibilities

Supervise.

Support implementation of funding plan.

Provide guidance in research.

Encourage publishing activities.

Reduce excessive burden with duties other than studies&research.

Follow up progress.

Communicate good scientific practices, ethical principles, and study requirements.

Assign some duties to advisor.

## Student's responsibilities

Prepare with professor a personal study plan.

Prepare with professor a research proposal.

Follow ethical principles of scientific research and good scientific practice.

Carry out independent research.

Participate in teaching.

Report progress, secure funding with professor.

Notify professor about changes.

Enrol at the university.

## 40 cr. of theoretical studies

## Research field module (T)

### 20-35 cr

## Scientific Practices and Principles -module (Y) 5-20 cr

<b>STUDYPLAN FOR DOCTORAL DEGREE</b>		<input type="checkbox"/> <b>CONFIRMATION OF STUDY PLAN</b>	<b>40 cr</b>
Doctoral Programme -			
<b>PERSONAL DATA</b>			
Last name and first names		Student number	
E-mail address		Telephone number	
<b>RESEARCH FIELD T (20-35 cr): (name)</b>			
Course code	Course name, literature, number of pages	Credits	Plan to do (ex. month/year)
<b>Total:</b>			
<b>SCIENTIFIC PRACTICES AND PRINCIPLES Y (5-20 cr)</b>			
Course code	Course name, literature, number of pages	Credits	Plan to do (ex. month/year)
<b>Total:</b>			
Date	Signature and printed name of the supervising professor	Total number of credits:	
<b>SIGNATURE OF APPLICANT</b>			
Date	Signature		
<b>DOCTORAL PROGRAMME COMMITTEE DECISION</b>			
<input type="checkbox"/> Study plan confirmed		<input type="checkbox"/> Study plan not confirmed (extract from the minutes enclosed)	
Date	Signature		

# Sources of credits

<https://into.aalto.fi/display/engdoctoraleng/Degree+structure+and+coursework>

Research  
field  
studies

Scientific  
practices  
and  
principles  
studies

- **Courses (doctoral level: L/P)**
- **Literature (70-120 pages / 1 cr)**
- **Seminars for doctoral students**
- **Conference presentations (max 8 cr)**
- **Learning of university practices (max 3 cr)**
- **MSc/BSc thesis instruction (max 9 cr)**
- **Pedagogic studies (max 15 cr)**
- **Studies in research methodology, research ethics, history and philosophy of science**
- **Scientific writing**
- **Supporting MSc courses**

# Experiences and expectations?

**Do you easily find suitable courses?**

**What is your experience so far about realising the study plan?**

**What additional information would you need?**



# Midterm review - Objectives

- Outline structured studies, research objectives, methods
- Steps toward publishable results.
- Strengthen the instruction/supervision
- Identification of problems.
- Training toward independence in research.
- Original study plan and research plan check-up.
- General feedback from team.
- Allow an early exit.

# Midterm review: Preparation

- For full-time students, and recommended for part-time students.
- The midterm review during the second year, or earlier if contract is ending.
- Supervising professor begins preparations 2 months ahead.
- Supervising professor instructs the student about the review details of the review.
- Recommendation: **review report** (progress, updated plan) and **presentation**
- Supervising professor prepares a **statement**

# Midterm review: Decision process

- The Doctoral Programme Committee reviews the material and identifies the following cases:
- **Case 1:** Student's review report demonstrates success and supervising professor's statement recommends pass
- **Case 2:** There is a clear discrepancy between the student's report and professor's statement (need to consult department head)
- **Case 3:** Student's review report is inadequate and supervising professor's statement recommends fail.
- Dean decides about the acceptance of the midterm review based on the Committee's proposal.

# Evolution of doctoral thesis

...1970s...1980s... 1990s...2000s...2010s

Monograph, one of the lifetime achievements  
Monograph, article dissertation with large number of papers  
Article dissertation with papers, monograph  
Article dissertation with less papers, monograph ...



# Doctoral dissertation at Aalto (2010-)

## Examples of awarded dissertations at ENG

2011. Monograph (22 citations in google scholar on 17 Apr 2019)

2012. Article dissertation with 5 accepted articles.

- The most cited article has 88 citations in scopus, synthesis 22 in google scholar

2013. Article dissertation with 5 accepted articles.

- The most cited article has 64 citations in scopus, synthesis 3 in google scholar

2015. Article dissertation with 4 accepted articles.

- The most cited article has 71 citations in scopus, synthesis 0 in google scholar

2016. Article dissertation with 3 accepted and 1 submitted articles.

- The most cited article has 42 citations in scopus, synthesis 2 in google scholar



# AAC Decision on doctoral dissertation at Aalto (all schools) in 2016.

## Extent of the doctoral dissertation

- the goal to complete their degree in four years of full-time study
  - complete the required doctoral studies
  - write a doctoral dissertation
  - workload proportionate to the objective duration of studies.
- *take into account in the course of the supervision of the doctoral candidate.*

<https://into.aalto.fi/display/endoctoraleng/Supervision%2C+research+and+dissertation>

# General quality requirements for doctoral dissertations (Aalto)

... new knowledge ...

- 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 fulfil 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 (Aalto)

**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.

1. **A single research piece or a monograph**
2. **Article-based doctoral dissertation**
3. **Essay-based doctoral dissertation**
4. **Other works meeting corresponding scientific criteria**



# Article-based doctoral dissertation (Aalto)

**The articles** 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.

# Doctoral dissertation at School of Engineering (ENG)

## 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

<https://into.aalto.fi/display/endoctoraleng/Supervision%2C+research+and+dissertation>

**ENG decision**  
ENG = Aalto university  
School of Engineering

# Doctoral dissertation at ENG

## Contents 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.

# Processing thesis manuscripts in the ENG Doctoral Program Committee

## Objectives

High quality of theses.

Successful pre-examination and public examination processes.

Harmonising the requirements between the Schools of the Aalto University.

Workload corresponds to 4 years of full time study.

# Typical thesis

## Number of articles in the article-based dissertation.

Publishing of papers in the high quality and best journals of the discipline: less but better.

Typically three to five articles in peer-reviewed forums.

Example: At least three articles in high quality peer-reviewed journals.

- A sufficiently comprehensive synthesis and three high quality journal articles.
- student has the first author or equivalent independent contribution.

# Monograph

## Content in monograph

requirements comparable to article-based dissertation, i.e., there is enough content for manuscripts of scientific papers.

# Student's contribution

Describe the student's independent contribution and the contributions of all authors for each article in the article-based dissertation.

The independent contribution of the doctoral student is explained in the monograph, when there are co-contributions in the work.

# Articles

## Accepted articles and submitted manuscript in doctoral dissertation

Articles in a compendium before pre-examination may include:

- Accepted journal papers (peer reviewed)
- Conference papers (peer reviewed)
- Book chapters (peer reviewed)
- One submitted manuscript to a journal (under review)

The submitted manuscript have entered the review process in a journal, i.e., submitted and returned manuscript is not permitted.



# Peer-review of articles

<http://www.tsv.fi/julkaisufoorumi/haku.php>  
<http://www.scopus.com/>  
<https://apps.webofknowledge.com/>

Articles in compendium must be peer-reviewed.

Good practice:

- Publish in forums that are listed in JUFO (classes 1-3) **and** Scopus **and** ISI (Web of Science)
- Scopus and ISI publications matter in the later research career
- Articles in JUFO 0 forums are **not** recommended in thesis

Document peer-review process if JUFO is not available (class="-")

- Is full paper is reviewed, are comments/revisions are provided by at least two independent reviewers?
- Does the pool of reviewers represents the scientific community to a sufficient extent?
- Provide review reports.

**Recommendations**

# Submitted article

The status may change before publishing the doctoral dissertation.

- **Submitted manuscript with minor revisions** required by journal reviewers becomes available before printing the dissertation. Minor revisions can be made before printing the dissertation.
- **Submitted manuscript with major revisions** required by journal reviewers becomes available before printing in the dissertation. Supervisor decides whether the major revisions can or cannot be accomplished in the dissertation. If the revisions are substantial the initial submitted version is printed in the dissertation (the one reviewed by the pre-examiners).
- **Pre-examiners require major revisions to the submitted manuscript.** Pre-examination comments are considered in the manuscript and the synthesis, and the status of the manuscript is documented as submitted to *-journal-* and revised according to pre-examination comments.
- **Submitted manuscript becomes rejected** by the journal before printing the dissertation. The initial submitted version is printed in the thesis (the one reviewed by the pre-examiners).

# Review processes are separated (thesis & submitted paper)

Student acquires the permission to print the paper/manuscript in the thesis.

Note that a publisher may not provide the permission before the publisher has the copyright of the manuscript (i.e. the manuscript is accepted for publication in the journal).

If the manuscript is required to be changed by both the pre-examiners and the journal reviewers, the pre-examination comments must be addressed and the manuscript in the thesis must be changed according to the pre-examination comments.

If the compendium is changed substantially outside the pre-examination process, e.g. the list of articles is changed or one of the manuscripts and the summary are substantially changed, the thesis manuscript is sent again to the pre-examination.

# Pre-examiners

<https://into.aalto.fi/display/endoctoraleng/Pre-examination+to+graduation>

Pre-examiners have a major role in quality control of dissertations. Professor proposes pre-examiners who have

- Familiarity with subject
- Doctoral degree + research experience
- Record of recent publication activity (e.g. 5 journal papers during past 5 years)
- Are not disqualified (e.g., different university, no joint publications with student, supervisor, or advisors during past 5 years)

# Message to supervisors and students

More responsibility, more flexibility.

Strive for high quality.

Supervisor (+advisors) and student outline the thesis content within the discipline.

The recommendation by pre-examiners have a major role in defining the requirements.

# Hints about documentation

## How to demonstrate novelty

- **Introduction: define research gap in the light of the literature (study and cite work by scientists who may review/examine your work)**
- **Discussion: reflection of results against literature, tell reader what is new in the light of earlier studies**
- **In each paper in compendium: prove novelty against literature**
  - Then it is easy to make the synthesis
- **In synthesis: give basis for the novelty of your objectives (define research gap) in introduction; add discussion that demonstrates new results against the literature context**