

CHEM-E0105

Academic Learning Community

Session 8: Master's Thesis Review 2

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27/3/2023



Aalto University
School of Chemical
Engineering



Thesis Review Module: Schedule

Session 7: March 20th, 2023

1. Introduction (Kyösti)
2. EndNote workshop (Valentina)
3. Thesis review assignment instructions (Kyösti)

Session 8: March 27th, 2023

1. Course news & feedback
2. Your comments / concerns / dreams on the thesis
3. What is master's thesis? Master's theses in Aalto
4. Instructions for finalising the assignment

Deadlines: ***1st DL: Thesis registration, Fri., March 31st***
2nd DL: Review report, Fri., April 28th

Course News

This is the last session of this course in this big lecture hall!

Tasks to be completed still during this spring

- Thesis Review report
- Academic advising meetings
- Second major-specific feedback session

*I will send reminders
of these activities!*

I will inquire about activities you have missed

- Most probably possible to make late submissions of some exercises/activities in May

Your feedback from last week

Many found the EndNote workshop useful

- The basic functions were shown
- Yes, I agree: the pace was somewhat fast
- The objective: to show you that EndNote is an option, giving you basic skills for starting to use it – to really learn, you need to work on the software independently
- Some said, they did not learn much – what should have been different?

Everyone is free to use the reference management software of their choice!

- Zotero, Mendeley, etc. are very good!
- EndNote presented because it is provided by Aalto

Very sorry for the low-quality recording of the session!

Very useful!

The teacher was sometimes hard to hear, and it felt quite chaotic overall.

The recording turned out kind of bad.

Your concerns about master's thesis

According to your answers:

1. Finding a topic/position
 - Especially from a company
2. Other concerns (without much details)
3. Time management
 - How to manage the big project
4. Is it very similar with the B.Sc. thesis?

Some students had no concerns!



Discussion in pairs/small groups (~5 min)

**Can you elaborate on the concerns, which you or your peers may have?
Any practical advice for getting over the concerns?**

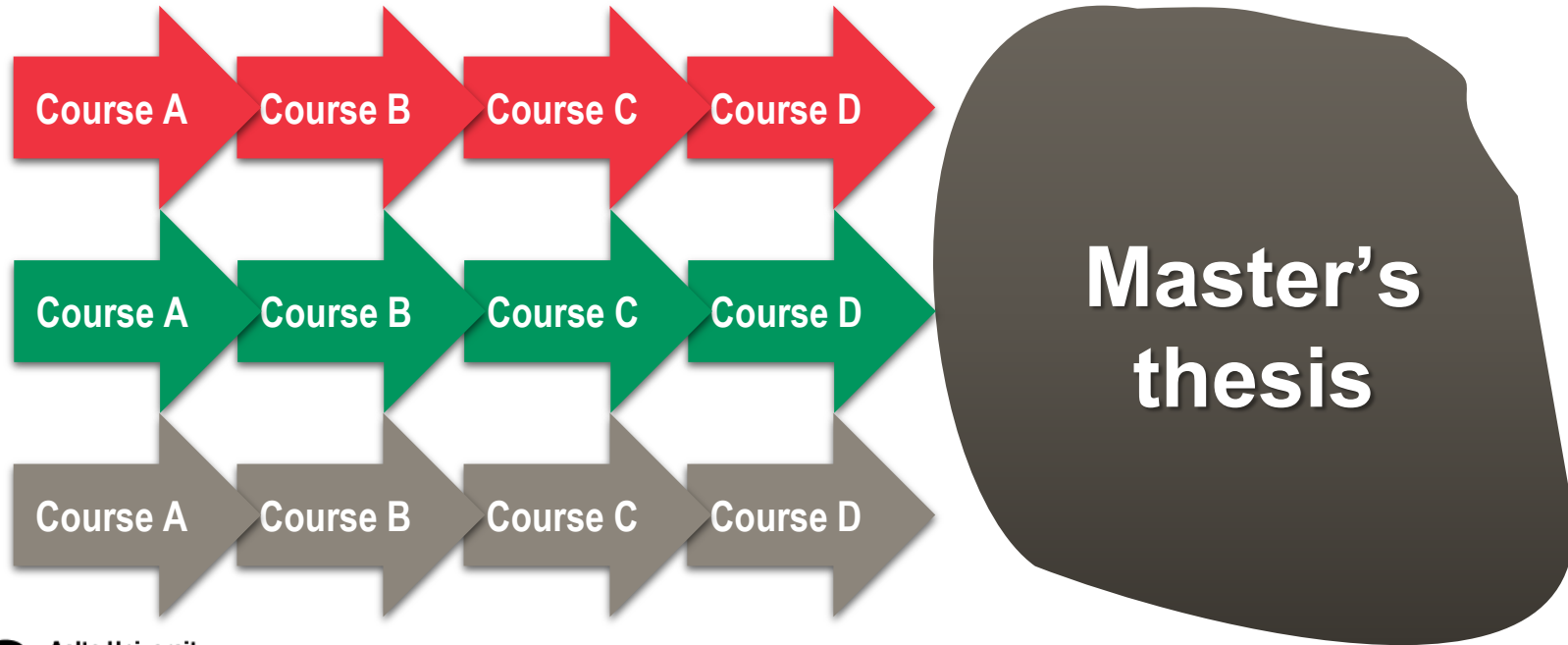
- Accepting the subject – who will do it?
- Who can you ask to be the supervisor?
- Supervisor is not very active (takes ages to review the thesis) – what to do?
- Advisor role?

How to manage a big project – discuss your experiences!

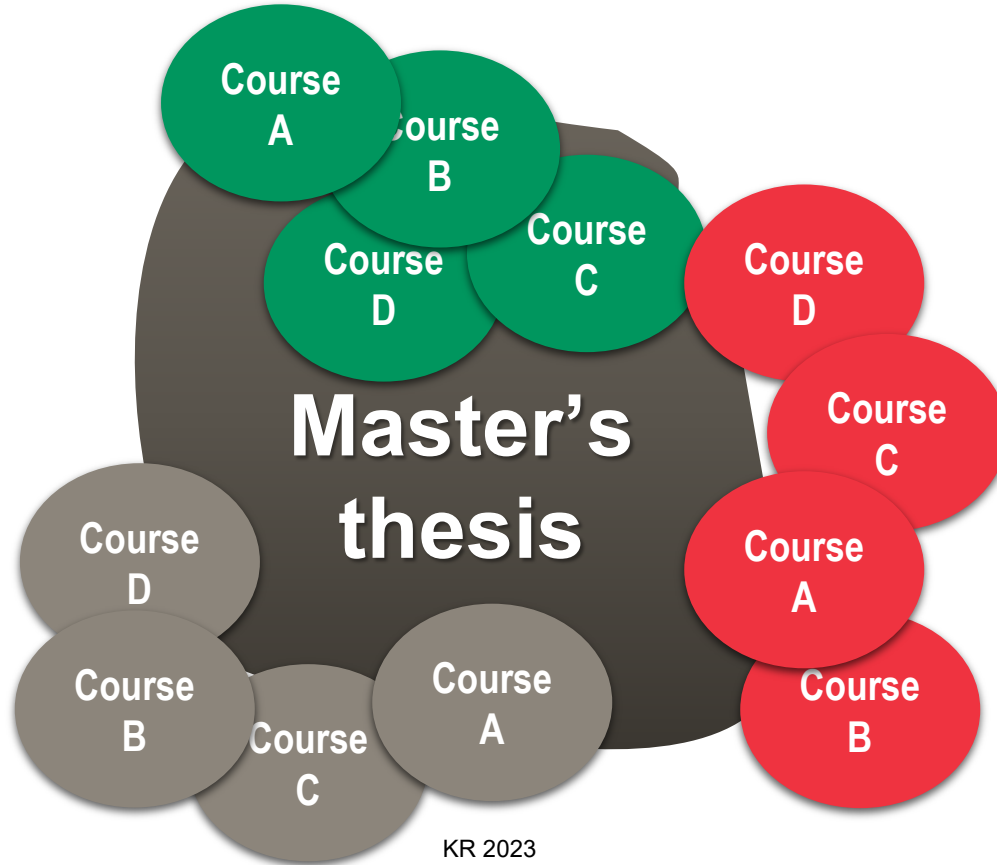
- Be sure to have the data, keep it organized, e.g. huge Excel sheet
- Scheduling the workflow, step-by-step
- Having smaller DLs over the work, e.g. regular meetings with advisor/supervisor

Students' comments displayed in green.

The studies aim for completing the thesis?



Thesis forms an integrated part of the studies?



Master's theses in Aalto CHEM

Kyösti Ruuttunen & Tapani Vuorinen

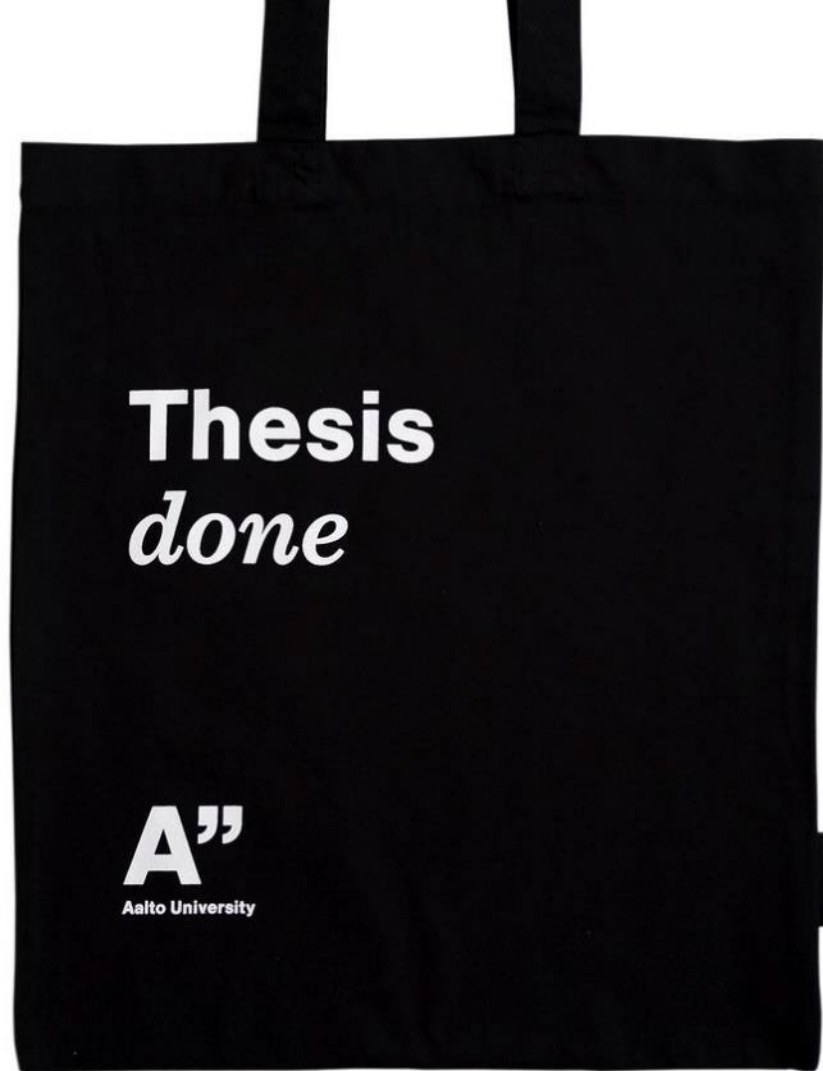


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Thesis done tote bags from Aalto Shop:

<https://shop.aalto.fi/p/676-thesis-done-kangaskassi/>

Photo: Anni Kääriä



About master's thesis work (30 cr)

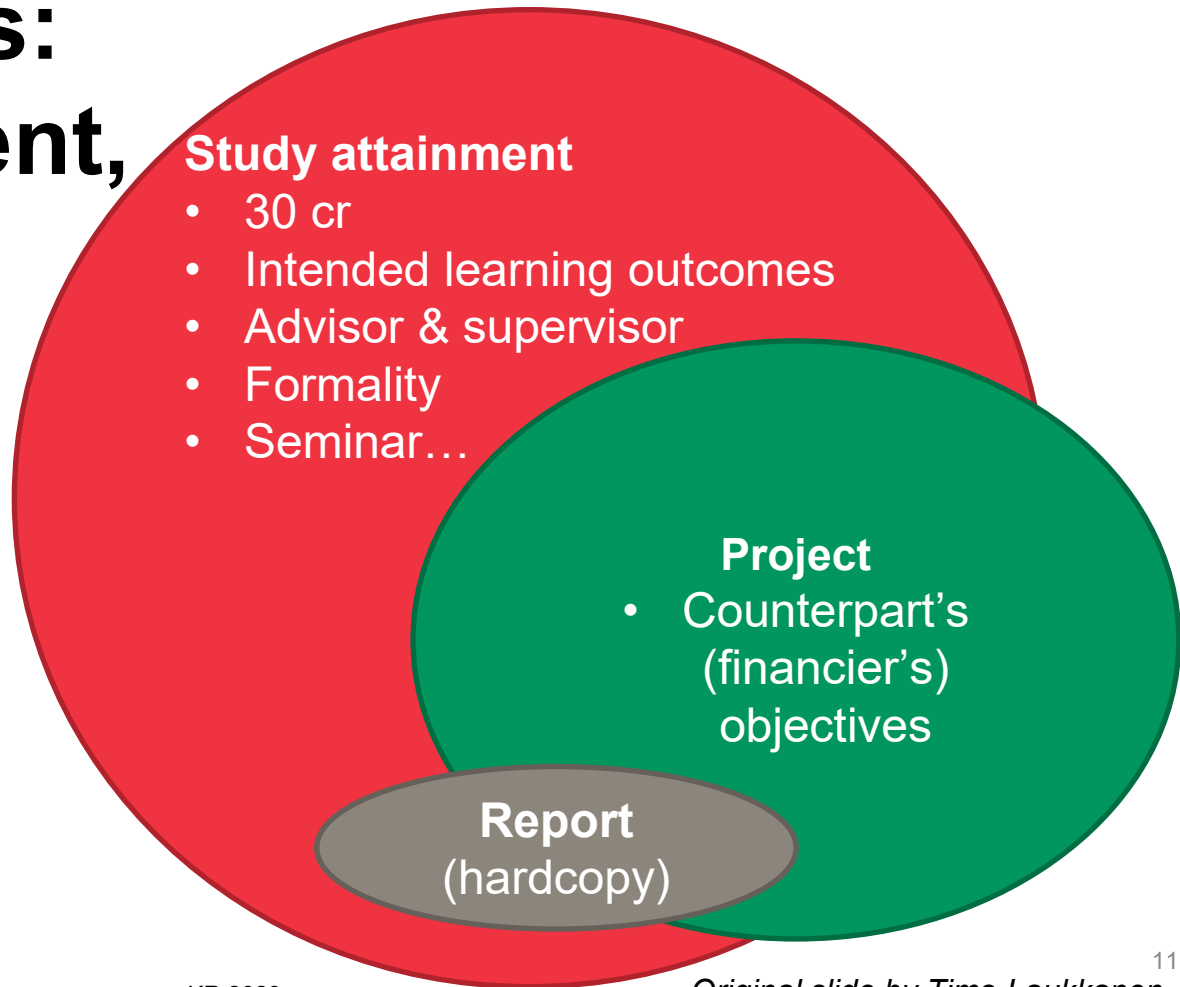
Compulsory part of studies – opportunity for specialization

- **The master's thesis is written on a topic related to the advanced studies of the degree programme**

General intended learning outcomes

- **Ability to apply the principles of science in solving research problems**
 - Building on existing knowledge
 - Using scientifically relevant methodology
 - Logical argumentation based on facts
- **Improved skills for exact technical and scientific communication in writing and orally**
- **To get experience in conducting an independent technical or scientific research project**

Master's thesis: study attainment, project, and report



Master's thesis work is a project

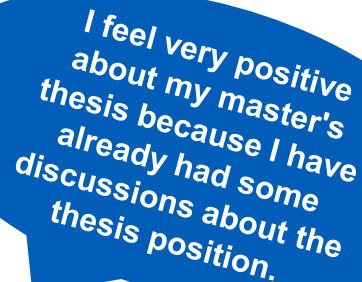
Project/research plan

- Goals and hypotheses
- Schedule for deadline and milestones, e.g.
 - Literature review
 - Detailed research plan for experimental work
 - Final thesis
- Resources
 - Own work (30 cr = 800 h)
 - Other resources depending on the project

Meetings and memos

- With/to the supervisor, advisor, company representatives

Deliverable = the written thesis



I feel very positive about my master's thesis because I have already had some discussions about the thesis position.

Main steps towards master's thesis

Search for and agree on a topic in collaboration with a professor

- Start the searching several months before the planned starting time of the thesis work

Apply for approval of the topic from the Degree Programme Committee (DPC)

- Check the application/meeting times beforehand

Carry out the work and write the thesis

Provide an oral presentation on the thesis and write a maturity essay (normally a summary of the work)

Apply for approval of the thesis from DPC

- Check the application/meeting times beforehand



I hope I can get an interesting topic :)



Is it so that you have to approach someone or are there some spots available that are somehow filled.

Alternative master's thesis positions

In Finland or abroad?

- Professors have broad international research networks and most universities accept visiting master's thesis students

In a company or other non-academic organization

- Direct connections or through professors
- The most important (50%) way to become employed after the graduation

In university

- Projects funded by companies – often followed keenly by the companies (opportunity to get familiar with the company representatives)
- Academically funded projects
- Personal, non-funded project

Is it "normal" (i.e., typical) for master's theses in the field of technology to be carried out as assignments from industry?

If one wants to do the thesis for a company, should one first contact the company or professor about the thesis?

Funding of master's thesis positions

Direct salary

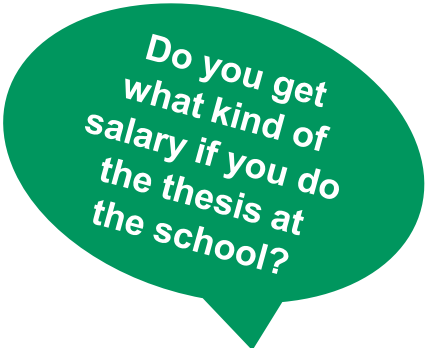
- In companies; agreement between the company and the student
- Externally funded full-cost projects in university; fixed salary level

Personal grants

- Funding through Aalto University's and other research foundations
- In some cases, directly from university or other organization
- Additional grants available for students doing their master's theses abroad

No compensation

- Freedom in selection of the topic



Do you get what kind of salary if you do the thesis at the school?

Foundation for Aalto University Science and Technology

Supports research and teaching in
technical disciplines at Aalto University:
CHEM, ELEC, ENG, SCI, ARTS/Architecture

Addresses grants to M.Sc. and Ph.D. theses
continuously, based on donations from
companies

Additionally, research grants from the Foundation's own funds once a
year

More information:

- <https://www.aalto.fi/en/foundation-for-aalto-university-science-and-technology> (in English)
- <https://www.aalto.fi/fi/aalto-yliopiston-tekniikan-tukisaatio> (in Finnish)



**Aalto-yliopiston
tekniikan tukisäätiö**



Application for master's thesis topic

Electronic application system

Prerequisites

- Completed Bachelor's degree or equivalent
- Personal study plan (HOPS) made
- Agreement with the supervisor

Information required (must be agreed beforehand with the supervisor)

- Supervisor^a (name)
- Advisor(s)^b (name, title, contact information)
- Topic with the thesis language (English, Finnish or Swedish)
- Degree programme and major

How the guidance of the Master's Thesis is arranged in Aalto?

^aThe supervisor must be a professor in Aalto University, in special cases a lecturer may also act as a supervisor with Dean's permission.

^bThe advisor(s) must own master's or higher academic degree.

Approval of master's thesis topic

By the Degree Programme Committee (DPC), which approves the topic and language of the thesis and nominates the supervisor and the advisor(s) under the following conditions:

- The prerequisites are fulfilled, and the topic meets the criteria for a master's thesis
- The supervisor cannot be an advisor
- The thesis can have one or two advisors (their names only should be printed in the thesis as advisors)
- The topic must be informative and should not contain abbreviations
- The approval is valid for one year (12 months) – the thesis should be submitted for approval within this time



It would be nice to hear about the subject approval process.

Structure of master's thesis

Introduction

- Background for the research question: motivation, focus, objectives, hypotheses

Literature review

- Should support solving the research question: understanding the system, learning from others and their research methodologies
- Should be critical and analytical

Experimental

- Exact description of the experimental methods applied (to be repeated by anyone else)

Results and discussion

Conclusions

Structure of master's thesis

Results and discussion

- Exact and concise presentation
- Focus on the main results (not individual observations)
- Error analysis and reliability of the results
- Connections to earlier literature

Conclusions

- Relative to the research question
- Claims on novelty
- Suggestions for further research

General guidelines for thesis work

Quality is always more important than quantity!

Typical workload division

- Studying literature and writing the review: 30%
- Planning and executing the experiments and analyzing the results: 50%
- Finalizing the writing: 20%

Maximum length 70-80 pages with appendices

- Appendices should be used for experimental details that are not necessary for understanding the main results/discussion

Typical number of literature references is ≥ 50

Discuss with your supervisor for personal guidelines!

Master's thesis and scientific article

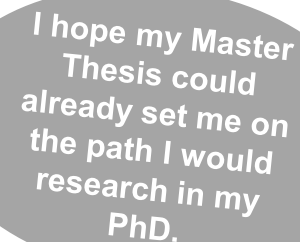
Scientific journals publish concisely written (i) literature reviews and (ii) original research papers

In comparison with master's thesis, a scientific article is much shorter, more condensed and focused

Master's thesis may contain new scientific data that could form basis of a scientific article

Additional benefits from writing a scientific article on the thesis research work

- Learning on 'real' scientific writing
- (Co)authoring a scientific paper is a merit when applying for doctoral candidate positions



I hope my Master Thesis could already set me on the path I would research in my PhD.

Approval of master's thesis

Apply for approval of the thesis from DPC

- Check the application deadlines and meetings from *Student Guide*:
<https://www.aalto.fi/en/programmes/masters-programme-in-chemical-biochemical-and-materials-engineering/graduation#10-study-administration-schedule-in-the-school-of-chemical-engineering>

Always agree the evaluation schedule with your supervisor beforehand

Electronic application system

- From February 2018, only an electronic copy (pdf/A-format) of the thesis is required

Evaluation criteria for master's theses

Definition of the research scope and goals

- Clarity, consistency, focus

Command of the topic

- Knowledge of relevant literature, depth of treatise

Methods

- Selection and use of methods, error/reliability analysis of data

Results and contribution

- Achieving the goals, novelty of the results, relevance and quality of conclusions

Presentation, language, and structure

- Clarity, coherence, conciseness, language, graphic design

Thesis process

- Own contribution, keeping in schedule

Evaluation process of master's theses

The thesis supervisor provides a numerical evaluation and a written statement to DPC and suggests a grade

- If the supervisor proposes grade 1 or 5, an independent statement from another professor is required

DPC decides on the grade based on the evaluation(s)

- DPC can decide on a higher or lower grade in the case of an ambivalent statement and after an additional review of the thesis

The student has a right to make an appeal on the grade

- The appeals are handled by a university level body; an additional investigation by DPC is asked, usually including a more detailed statement from the supervisor

Grade distribution for master's theses

Statistics from previous few years

- Grade **5** (excellent): 10-15%
- Grade **4** (very good): 55-65%
- Grade **3** (good): 20-25%
- Grade **2**: 5%
- Grade **1**: 0%

- Theses with grade **5** compete on few thesis awards in each year
- Grade **4** is one of the requirements to get the right to study for doctor's degree at Aalto CHEM
- Few appeals yearly – typically no changes in grades

Publicity of master's thesis

Master's thesis is a *public document*

Master's thesis will be available in the Learning Centre and also saved in the Aaltodoc database (<https://aaltodoc.aalto.fi/>)

- Metadata and abstract will always be available online
- The student can limit the online publicity of the full text of the thesis (please note that the thesis can still be accessed in selected workstations in the Learning Centre)
- The online publication can be delayed up to one year for reasons like
 - Filing a patent application
 - Submitting an article to a high impact scientific journal

Graduation and degree certificate

Apply for graduation in the electronic system (eAge)

- Check the application deadlines and graduation dates from the Student Guide
- Graduation ceremonies are held four times per year (by invitation only)

Language of your master's thesis

- Please note that if you do your thesis in Finnish or in Swedish, the language of the degree is Finnish or Swedish. In this case, when you graduate, you will receive a Finnish language degree certificate or a Swedish language degree certificate and its translation in English.
- If you do your Master's thesis in English, the language of the degree is English. In this case, when you graduate, you will receive both a Finnish language degree certificate or a Swedish language degree certificate and an English language degree certificate.

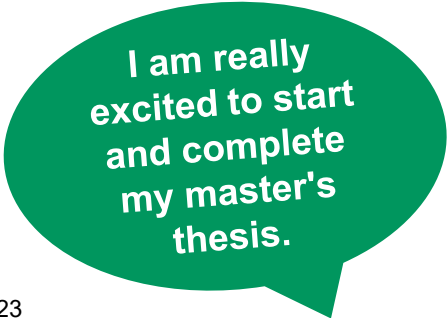
Bachelor's thesis vs. master's thesis

Bachelor's thesis

- Workload (credits/hours):
- Contents:
- Schedule:
- Language:
- Other aspects:

Master's thesis

- Workload (credits/hours):
- Contents:
- Schedule:
- Language:
- Other aspects:



I am really
excited to start
and complete
my master's
thesis.

Thesis review exercise

Instructions



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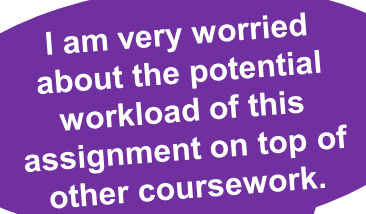


Thesis Review assignment

Objective: prepare students for carrying out their own thesis works efficiently

Estimated workload: 4 h study sessions + 17 h independent work

- 1. Choose a Master's thesis, and register it**
 - The thesis must be from our School, must be available online as a pdf!***
- 2. Read the master's thesis**
- 3. Analyze it against the instructions and evaluation criteria**
- 4. Write a summary on your observations**



I am very worried about the potential workload of this assignment on top of other coursework.

Thesis Review exercise

MC workspace → *Thesis Review*

- *Register* the thesis you have chosen; DL *March 31st, 2023*
- *Read the instructions* and the questions carefully
- Carry out the work
- Write a report (1300-1500 words)
- Submission DL *April 28th, 2023*

Wishing you success with the exercise!

For passing this course, passing this exercise is required!

P.S. Remember to answer today's quiz!
And the quiz from last week, as well!