



## Carrying Out Thesis

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**Purpose:** To assist students and supervisors/examiners.

**Process:** This document contains process maps. For more specific information about each step the text following should be read. All steps of relevance should be carried out as recommended.

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## 1. Introduction

### 1.1 Purpose

The thesis work is the final task of a Bachelor's and Master's degree. In this major assignment the student is given the opportunity to apply his or her knowledge and skills.

The purpose of the thesis is for the student to show that he or she can:

- structure, plan and complete a major assignment including problem solutions
- apply his or her knowledge acquired in the degree program working on the assignment
- assimilate the content of relevant specialist literature and put the work into this context, and
- show good ability in written and oral communication.

The thesis work should be chosen so that it contains some form of investigative or comparative study, research or development, so that a well formulated result is achieved that should be of interest to others in various contexts.

### 1.2 Scope of Thesis Work

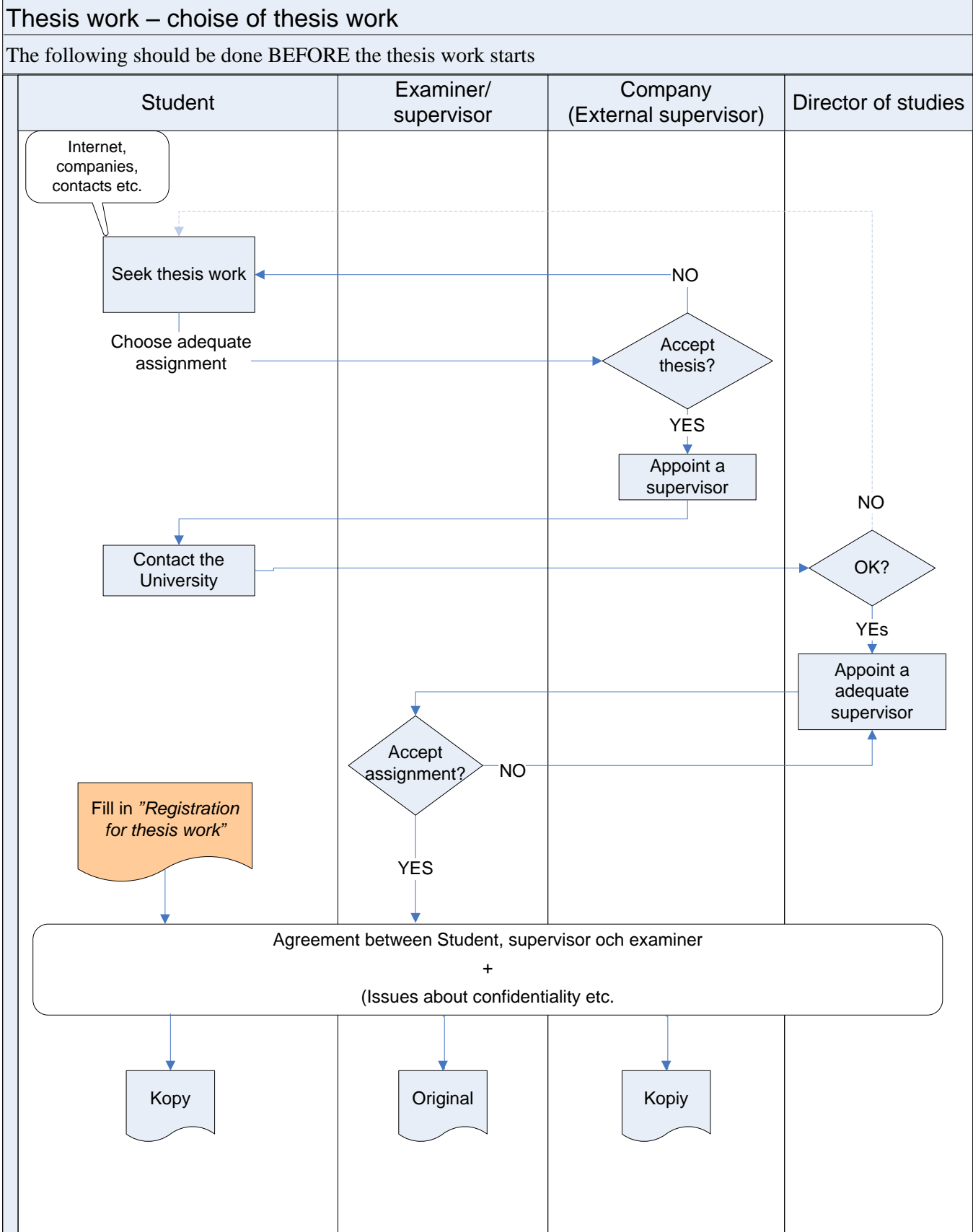
The thesis work gives, when passed, 15 ECTS for a Bachelor's or a one-year Master's student, and 30 ECTS for a two-year Master's student. The work is normally conducted during a semester or during the last period of the last semester. The difference between the various types of theses is in the content and depth rather than structure. Fifteen ECTS corresponds to an estimated effort of approximately 400 hours.

The thesis work is the final part of the education and the objective, among others things, is that the student applies his or her acquired knowledge. Due to this the thesis work may not be started if the student lacks 22,5 ECTS (i.e. 3 courses) or more for a Bachelor's or 7,5 ECTS for a one-year Master's program. This has to be confirmed. The director of studies can give exemption.

The thesis work is performed together with a company, another organization, or at the University of Borås. Thesis work is conducted in a group of two students. In exceptional cases the work can be conducted individually. If special reasons exist, the group may be comprise more students. Decisions about this are to be taken by the relevant director of studies.

### 1.3 Costs

Normally the students pay their own costs, e.g. travel costs. In exceptional cases the School of Engineering may pay costs. However, every exceptional case must be approved by the examiner. There are also funding grants or stipendia that can be applied for by the student if he or she wants to perform the degree work outside of Sweden. Visit the University of Borås website for further information.





## 2. Choice of Thesis Work

### 2.1 Searching for Thesis Work

Students should actively try to find a suitable assignment by themselves. The search for an assignment should start well in advance, preferably during the previous semester. One suggestion is to visit different companies' and organizations' websites, where you might find suggestions of thesis work listed together with contact persons.

On agreeing an assignment, it is required that an external supervisor at the company/organization be appointed. He or she should fully understand the assignment and allocate time for guidance when so required in order to ensure that work on the thesis proceeds according to plan. Supervisors will ensure, as far as possible, that a workplace and necessary facilities are available for students carrying out thesis work. The thesis work must be connected to the relevant program or education and be in the field of engineering. The choice of assignment, however, must always be approved by the examiner.

Alternatively, students may discuss doing an individual thesis work (i.e. one that is not directly related to a company) at the institution with their professor or director of studies. If the thesis work is internal it is enough with only one tutor at the institution.

### 2.2 Examiner and Supervisor

In both the above alternatives, a thesis work will have an examiner appointed by the University of Borås and also a supervisor where applicable. Examiners are appointed by the Director of Studies at the institution which is normally the teacher(s) whose area best corresponds to the thesis requirements. The examiner assumes principal responsibility for the thesis work. Irrespective of where the thesis work is carried out, it is the examiner who is responsible for the scope and level of the project corresponding to those objectives and requirements set out in the research plan, and, in addition, for setting grades.

Supervisor should ensure that students receive appropriate help with practicalities, questions of methodology and knowledge of the relevant subject, formulation of problems and delimiting work. In addition, help should be given in timelining the project and with the writing up of thesis dissertations. Since the examiners and supervisors have a lot of commitments it is important that students prepare themselves before supervision. Sometimes it can be difficult to find the examiner or supervisor, therefore contact the examiner or supervisor via e-mail or phone and make an appointment when a meeting is desired.

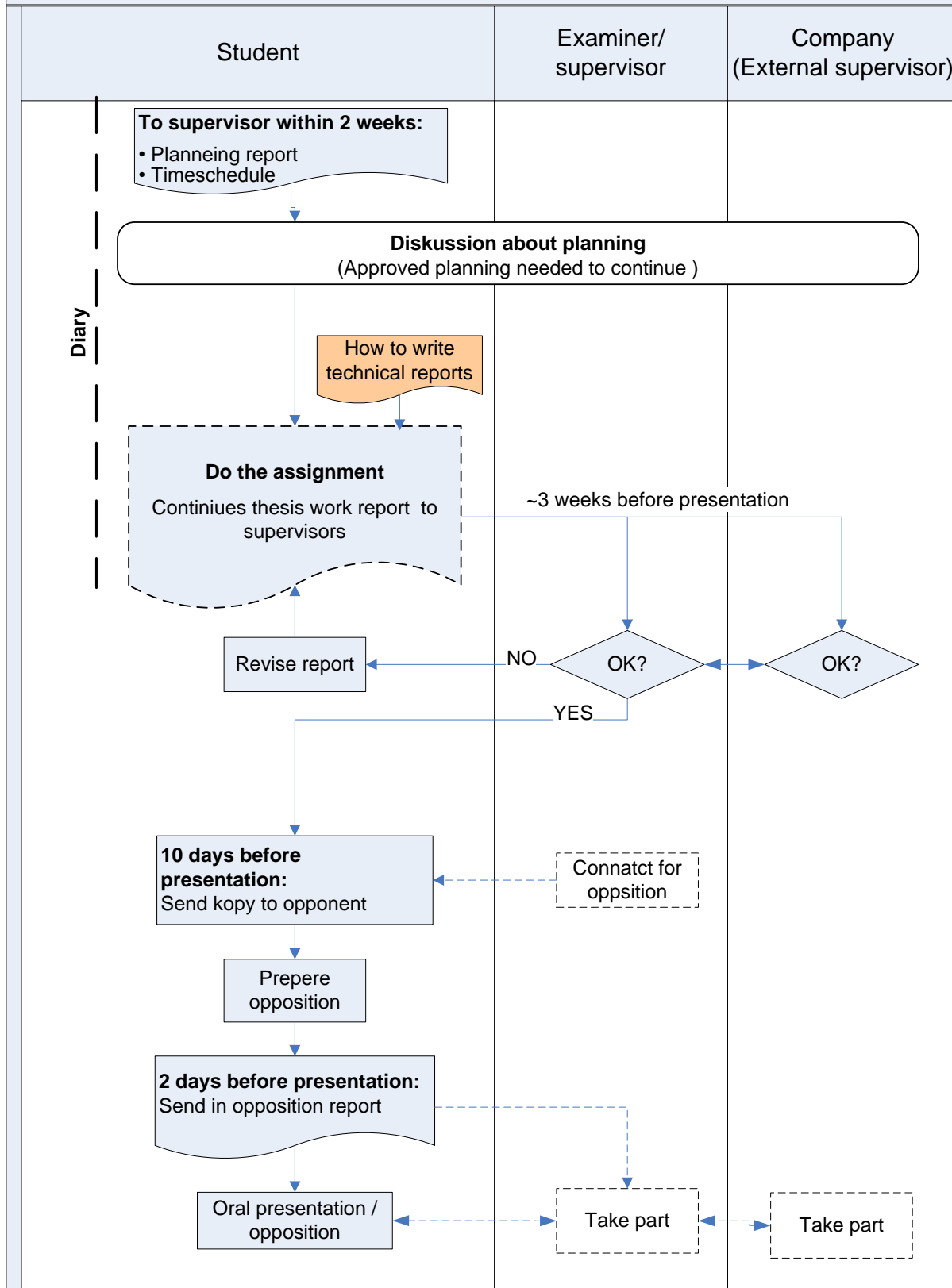
### 2.3 Agreement between Student, Examiner and Supervisor

After agreement with the supervisor and examiner students fill in the form [Registration for thesis work](#) at the University of Borås. After filling in the form students are to submit the form to the examiner and a copy to the supervisor at the company. **All students are to individually fill in a form**, even when working in a group. Issues about patent, confidentiality, copyright etc shall be fixed in a written agreement **before** starting the thesis work. After the oral presentation the written report is normally public.



Thesis work – Carrying out the assignment

The following should be done DURING the thesis work





### 3. Carrying Out Assignment

#### 3.1 Planning report

Within 2 weeks of the start, the student designs a preliminary project plan with a time schedule for the whole thesis work. The project plan should specify and define the project, and then be changed and updated when needed. The student is responsible for the project plan and following it.

The planning report is important and compulsory. It should be submitted to the examiner at University of Borås and to the supervisor at the company or organization. The following parts shall be clear and included in a planning report:

1. **Preliminary title.** The title should be short, concise and informative. It should tell the reader what the work is about, and it should attract the reader.
2. **Background and problem description.** This section should attract the reader to the subject field, clarifying research questions and giving reasons for the choice of topic. The work should be placed in the context of previous research in the subject field. Important works in the field should be referred to and correctly referenced.
3. **Purpose and limitations.** The purpose is a specification of the problem description. You are responsible for writing a clear and well-formulated purpose. It is important that you think about how much work is realistic and try to prioritize the work.
4. **Description of method(s).** Here you should discuss what methods are available and which should be used and why. Select the method that will help you to achieve your purpose. The discussion should include both research methods and data sampling methods.
5. **Outline.** You should show the logical disposition of the thesis, with a preliminary table of contents.
6. **References and literature.** At the beginning of the thesis work you should conduct a literature study. Here you present the literature you have studied and will study.
7. **Time schedule.** You should write a detailed time schedule. Do not forget to include eventualities such as holidays, time for re-examinations, reading etc. You should have a clear deadline in your time schedule.

Elements	week 1	week 2	Week 3	week 4
Contact with company	→			
Contact with UCB	→			
Planning	→			
Registration	→			
Empirical work		→		
Writing the report	→			
Presentation				→

**Figure 3.1** The figure shows a simplified example on one Gant-chart in order to perform a thesis work. The elements can be divided up on more detail level.



The time plan can later gradually be specified, changed and updated (see figure 3.1). The student is responsible that the schedule is followed. All changes, events and factors that obviously influence the work in time-, results - or quality aspects should be documented and announced to the supervisors.

### 3.2 Diary

Status reports of conducted work are done by the student in a project diary. The student must continuously write down events. Planning and reporting are important for the quality assurance of the thesis work. It also ensures that the work is carried out in reasonable and/or sufficient scope and within the correct time.

### 3.3 Writing the Thesis

The Bachelor's and Master's theses are always documented in a dissertation. The content and form are examined by supervisor and examiner before being approved. A thesis work is an academic process, which is presented in a clear and well structured dissertation. In this dissertation the scientific value of the work and the results are described. This means that the structure is substantially the same whether it is a Bachelor's, Master's or even Doctoral thesis. A thesis must include:

#### *Summary*

The author writes a summary of the whole thesis including title. A summary is the thesis minimized to a single page.

#### *Background*

The background to the problem is presented in this chapter in such a way that the reader understands that it is a problem interesting enough to study. This chapter should also contain the limitations of research questions, and the reasons for the limitations. It is important that the chapter is interesting to the reader. This chapter should also discuss previous research relevant to the thesis work (with references).

#### *Theoretical frame of reference*

In this chapter the theories used in order to solve the problem are presented. What theories have you used? They should all be clearly presented, with correct references to books, articles and websites. The reason for the choice of theories should also be presented.

#### *Research methods and data sampling methods*

In this chapter you describe different research methodologies and research sampling methods. Which have you used and why? How did you structure your work in order to answer the questions in the introduction? What method for analysis will you use?

The research approach should be decided according to the type of problem and the purpose of the research. The three major purposes are description, explanation and exploration. These can also complement each other.



Description might be the main purpose when investigating a new, interesting phenomenon, i.e. basically documenting it. When the purpose is explanatory, the dissertation seeks to explain the pattern related to the phenomenon and to identify likely relationships with other phenomena. A study with an exploratory purpose is intended to investigate a phenomenon that is little understood, to identify categories of explanations, and to generate hypotheses and research questions for further research.

### ***Evaluation of methods and data***

Validity, reliability and generalization are differing measures of the quality, accuracy and potential of the research, conducted with certain methods and disciplinary principles.

Validity means an instrument's ability to measure what is meant to be measured. If the research is valid, the researcher has done what he or she says he or she would do. Reliability involves the accuracy of the chosen research methods and techniques, i.e. how reliable and accurate the produced data are. A measurement tool should, for instance, give reliable and stable results. Generalization means the extent to which the researcher can make a wider claim on the basis of the research and analysis, i.e. are your results context-free?

This chapter should include a discussion of the validity, reliability and generalization. The purpose is that the reader should be able to build his or her own opinion about the thesis work.

### ***Empirical work***

This chapter includes a presentation of the organization and the results of the investigations, calculations or measurements that have been performed and a description of the methods or instruments used.

In order to answer your research questions in the introduction, you perhaps used a questionnaire. If so, the questions and the answers are presented here. Or if you used observations, then the results from them are written here. Only those results used in the analysis are presented here. Less important results can be placed in appendices.

### ***Analysis***

This chapter contains mainly a combination of the theories and your results. You put it together in an analysis or perhaps interpretation. You use the method of analyses that you have already described in the chapter about methods.

### ***Conclusions***

In this chapter or section your conclusions are described. The answers to your research questions must also be here. These conclusions are grounded in the chapters about theories, the empirical part and analysis.

### ***Future research***

In this chapter you present suggestions for further research that you have discovered, but did not include in your present thesis work.





### **References**

All theories and texts collected from other authors shall be referred to in a correct way. (See library resources)

The thesis work must also be approved by the examiner in terms of style, language and layout. The thesis should include title page, summary or abstract, table of contents, the main report, list of references and possible appendices. The thesis should be written according to the current routines for thesis work at School of Engineering.

For more detailed information, see [How to write a technical report](#)

### **3.4 Examination**

The report should be handed in firstly to the supervisor and then to examiner/supervisor at the University for review, approximately 3 weeks before the presentation date. After that it has to be checked and will possibly be revised.

The thesis work is graded according to the Bologna agreement. The following aspects are under consideration:

- the work performance and achievement,
- the written report,
- the oral presentation,
- the written opposition of another thesis,
- the oral opposition of another thesis.

You should not write articles or contributions to conferences in the name of the University of Borås. It is important that you finish your courses and your degree before.

### **3.5 Oral presentation**

Every thesis work is to be orally presented. This is mainly conducted at a seminar at the end of the period of thesis work, normally at the end of the spring semester. At the seminar the students present their work, followed by an opposition of their thesis. The seminar is compulsory for the whole class and also students from lower grades are invited. Representatives and supervisors from companies and organizations are also invited. The structure of the seminar is as follows:

- Introduction (the seminar leader)
- Presentation of thesis work (the students) 20 min
- Opposition of thesis work (another student) 5 min
- Closure with questions from the audience 5 min



### 3.5.1 Opposition

The opposition means that the student reads an essay summary and gives constructive criticism after a model. Every thesis work should be opposed and the opponents are to present the opposition both orally and in a written report of approximately 1-2 pages. The opposition aims to give exercise in critical peer review. This peer review process should both address what is good in the essay and propose improvements.

See to it that you get the whole thesis **10 days, at the latest, before** the opposition

#### **For the opponents:**

- Read the thesis thoroughly.
- Structure the opposition
- Hand in the written opposition report to the supervisor for thesis work **two days before** the presentation.

#### **During the opposition you should focus on the following:**

- Do the authors tackle the problem in a scientific and systematic way?
- Have the authors made a conscious choice of methods?
- Does the work have a clear theoretical approach?

Please observe that the opposition should be a help to the authors and should therefore be formulated in a positive and constructive way. Leave suggestions for improvements if necessary.

Hand in the written opposition report to the supervisor for thesis work **two days before** the presentation. In addition gather all your improvement suggestions in a list, which you present to the authors after the oral presentation/opposition.

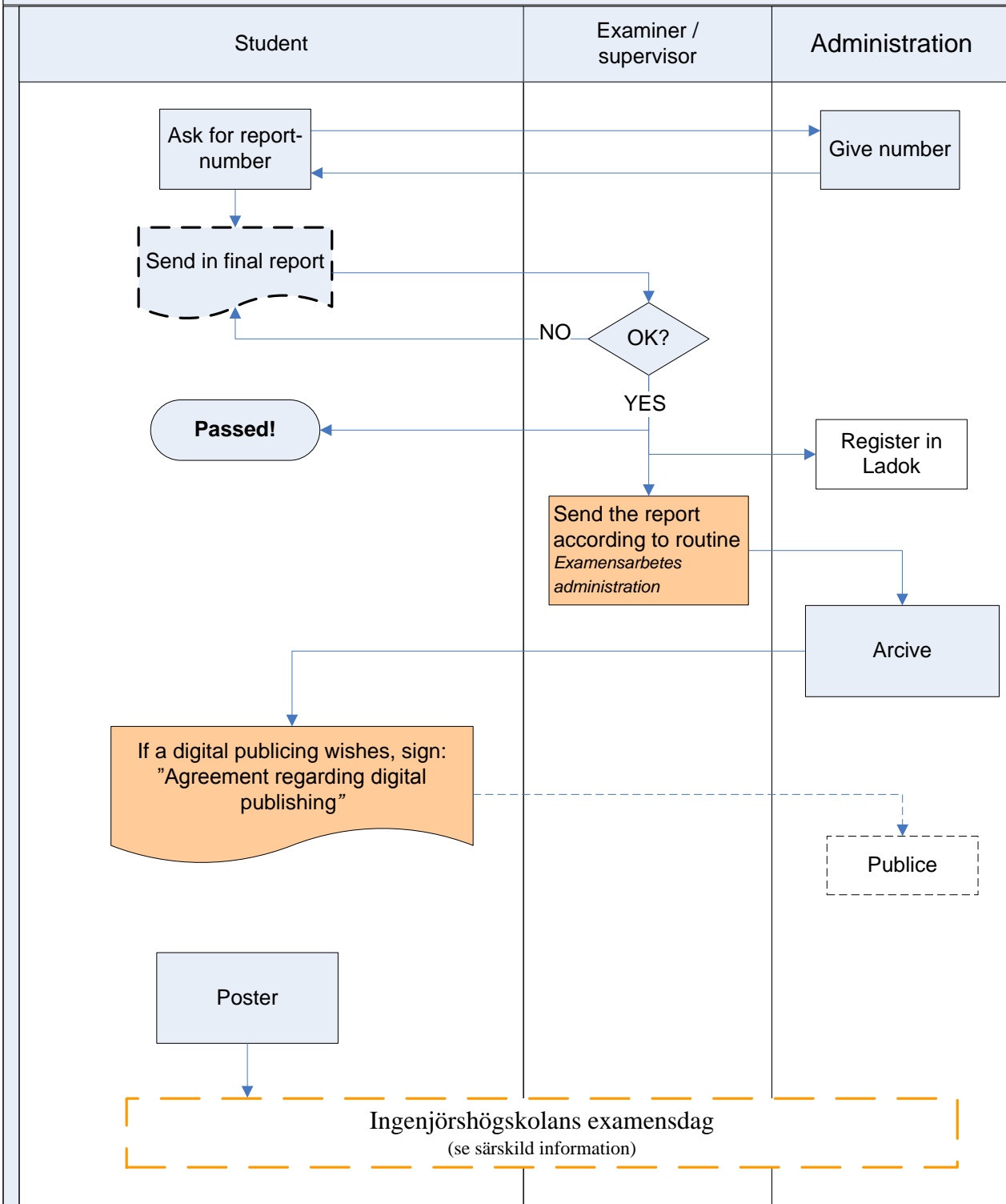
#### **The following can be discussed during the oral opposition:**

1. The oral presentation of the thesis
2. The topic and problem area
3. Problem discussion and purpose
4. Demarcations
5. Language and layout
6. Honesty and critical approach
7. The overall impression



## Thesis work – After the thesis work

The following should be done AFTER the assignment



## 4. After the Thesis Work

### 4.1 Handling and Publishing the Thesis

The student hands in the thesis to the supervisor at the company first, and then to the supervisor and examiner at University of Borås. The submission should be at least **3 weeks before** the oral presentation. After adjustments (if any) the thesis is given to the examiner for approval.

Your completed thesis dissertation should be converted to .pdf format and sent to your examiner as an e-mail attachment. In this e-mail you should write your names and civic registration numbers. (On the computers at UCB the .pdf conversion is easily done in MS Word or Open Office. Otherwise you can use a free tool on the web, e.g. [www.pdfonline.com](http://www.pdfonline.com). Check carefully the result!).

The thesis reports are published in Borås Academic Digital Archive, [BADA](#). Every thesis published there receives a unique address that will not be affected by a change of server etc. More information is given on the website of the library about [digital publishing](#). To do this the authors should each sign an [Agreement regarding digital publishing](#) and give/send it to the thesis administrator [Sari.Sarhamo](#). Read the English translation of the agreement below.

When the examiner has passed your thesis he or she will forward the e-mail to the secretary. That means that the thesis can be registered in Ladok (the study documentation system), and be published in BADA. In addition to the publishing in BADA, a paper copy will be filed in UCB:s archives as a public document

You will receive a free bound copy each (with laminated cover), and one for your supervisor.

### 4.2 Applying for Awards

Both national associations and the local business community show their appreciation for the students' and the university's work by handing out a number of grants. Please note that grants must normally be applied for actively by the student.

### 4.3 Student participation and evaluation

Student participation and evaluation is very important. The head of department and the course coordinator are responsible for a continuous and systematic collection of students' views. The evaluation report is completed by the students and provides the basis for the future design of the course.