University of Stavanger

FACULTY OF SCIENCE AND TECHNOLOGY

Student Guide for Bachelor's and Master's Theses

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Introduction

This guide provides information you need about bachelor's and master's theses, as well as advice on how to proceed at the beginning of, and during, your work on your thesis. The guidelines for bachelor's and master's theses are based on regulations laid down by the faculty. The regulations can be found in the guide *Regulations for Bachelor's and Master's Theses*.

1. Starting your thesis

1.1 About theses

Bachelor's and master's theses are independent pieces of work in which you must apply the knowledge you have accumulated during your studies to solve a specific project. It is through this project that you will show your abilities and qualities as a future employee.

The project is normally be carried out in the last semester of your studies. The exception to this rule are 60-ECTS master's theses, which are completed over two semesters. By this stage you will normally have acquired the knowledge and know-how needed to carry out a project relevant to your programme.

You may notice that you are registered for teaching in your bachelor's or master's thesis in the autumn semester in Studentweb (5th semester of a bachelor's degree or 3rd semester of a master's degree). This is because in the autumn you will receive a lot of useful information via Canvas about writing a thesis. However, the actual writing of the thesis will not start before the spring semester (6th semester of a bachelor's degree or 4th semester of a master's degree). This is when you have been registered for assessment.

1.2 What do I do now?

It is important to start thinking early about what kind of thesis you want to write. There are several ways of doing this:

- You may have your own idea that you wish to develop.
- You may have been in contact with a company, had a part-time or summer job, etc. Here you may have become aware of a topic/problem that the enterprise wishes to investigate.
- You may find an interesting topic among the projects published by the department in the Collaboration Portal.

Looking at earlier theses can be a good idea. These may provide inspiration and help you formulate ideas and relevant questions. Earlier master's theses are available from the library and earlier bachelor's theses from the faculty. After the department has published its list of projects, you can apply for some of them in prioritised order. If you have found a project yourself, it must be registered. The department will hold an information meeting about all you need to know in order to carry out a project.

Common to all departments is that once you have been awarded a project or have registered your own project, you must sign a contract with the department concerning carrying out the project. You use the Collaboration Portal for this. By signing the contract you are confirming that you will carry out the project you have found or been awarded. The contract is also used for assigning an office, borrowing equipment or books, using laboratories and finally for submission of your finished thesis. If you will be writing your thesis as part of a group, a group contract must also be completed. This is also available from the Collaboration Portal. This must be completed by each student and submitted electronically by the applicable deadline.

Once the contract has been submitted in the Collaboration Portal, the project has been **accepted**.

Please note that if you have found the project yourself, you must register it in the Collaboration Portal by the deadline stated in Table 1. One of the instructors will assess the project and whether it is feasible given the resources that are available. You may be asked to improve the project before it can be approved academically.

The department may decide to assign a different staff member to your project. As a rule, this is because we try to distribute projects as evenly as possible between the academic staff in the department.

If you accept a project in collaboration with an enterprise or other institution outside the University of Stavanger, you will, in addition to a course coordinator, be assigned a supervisor, who will normally be employed by the external enterprise or institution. If you accept a project published by the department, the course coordinator and supervisor will often be the same person.

1.3 Deadlines

The annual cycle for bachelor's and master's theses is shown below.*

Thesis	Bachelor's thesis	Master's thesis, 30 ECTS	Master's thesis, 60 ECTS
Deadline for department's information meeting	15 Oct	15 Oct	15 Mar
Deadline for publishing projects by the department, faculty or external enterprise[1]	15 Oct	15 Oct	15 Mar
Deadline for students to register their projects[1]	15 Nov	15 Nov	15 Mar
Deadline for applications for projects[1]	1 Dec	1 Dec	1 Apr
Deadline for announcing awarded projects[1]	15 Dec	15 Dec	15 Apr
Deadline for the formal acceptance of projects	15 Jan	1 Feb	15 Sept
Thesis semester	**Spring**	**Spring**	**Autumn and spring**
Withdrawal deadline	1 Apr[2]	1 Apr[3]	1 Apr[3] (**01.11 for BIOMAS**)
Withdrawal deadline for theses outside the normal period	1 Nov [2]	6 Oct [3]	6 Oct [3] (**27 Oct for BIOMAS**)
Submission deadline for assessment[6]	15 May	15 Jun	15 Jun
Deadline for department to appoint examiners	2 May	1 Jun	1 Jun
Deadline for assessment	6 weeks	12 weeks	12 weeks
Diploma	If you fulfil the requirements for a diploma after your thesis is assessed, it will be sent to you automatically.		

Table 1 showing the annual cycle for bachelor's and master's theses. [1] This must be done electronically via the Collaboration Portal, [2] The withdrawal deadline is 6 weeks before the submission deadline, [3] The withdrawal deadline is 10 weeks before the submission deadline. [6] Indicates that this should be done electronically in Inspera.

* Please especially note section 1.6 of the *Regulations for Bachelor's and Master's Theses*, which states the following:

The withdrawal deadlines for bachelor's and master's theses are specified in section 3-9(6) of the *Regulations relating to Studies and Examinations at the University of Stavanger*:

- The withdrawal deadline for bachelor's theses is **1 April**, i.e. 6 weeks before the submission deadline.
- The withdrawal deadline for master's theses is **1 April**, i.e. 10 weeks before the submission deadline.
- The withdrawal deadline for master's theses in biological chemistry (**BIOMAS)** is **1 November**, i.e. 6 weeks after accepting the project. This is due to the expensive laboratory exercises.

- If a bachelor's thesis is going to be written outside the normal period, the withdrawal deadline is 1 November, i.e. 6 weeks before the submission deadline.
- If a master's thesis is going to be written outside the normal period, the withdrawal deadline is 6 October, i.e. 10 weeks before the submission deadline.
- If a master's thesis in biological chemistry (BIOMAS) is going to be written outside the normal period, the withdrawal deadline is 27 October, i.e. 6 weeks after accepting the project. This is due to the expensive laboratory exercises.

Oral notification of withdrawal is not valid. If candidates who have enrolled for a bachelor's or master's thesis withdraw after the specified deadline or fail to submit a thesis before the deadline without a valid reason, they will be deemed to have presented for examination and this will be counted as one attempt. Candidates are responsible for documenting that a withdrawal before examination was made by the specified deadline, cf. section 3-9(4) of the *Regulations relating to Studies and Examinations at the University of Stavanger*.

If students want to withdraw from a bachelor's or master's thesis, the student(s) must withdraw from assessment in Studentweb and also send an email to both the course coordinator, or supervisor, and study advisor.

There are no continuation examinations for bachelor's and master's theses, ref. section 3-11(3) and (8) of the *Regulations relating to Studies and Examinations at the University of Stavanger*.

1.4 Planning your project

It is important to plan your work carefully and keep track of where you are at all times. Bachelor's and master's theses are also intended to be practice in solving a problem within a given timeframe. You must draw up a timetable at the beginning of your project. You must also write regular status reports as agreed with your course coordinator and possibly your supervisor. The standard workload for a thesis is 30 hours per ECTS according to the faculty's norms. A 15-ECTS bachelor's thesis involves an estimated workload of approximately 450 hours. As far as a 30-ECTS master's thesis is concerned, the normal workload will be about 900 hours. It is important to take account of this in your planning. The standard workload for a 60-ECTS master's thesis will be 1,800 hours.

2. Execution

2.1 Working safely

The University of Stavanger attaches great importance to the safety of its students and staff. The work on your project must be carried out safely. This means that safety must come first. No unnecessary chances must be taken in order to complete the work. The type of risks involved will vary from project

to project. They can range from strain injuries to noise, conflicts, chemicals, high pressure and temperatures, dangerous machinery, etc.

Before you start the work, think through the following:

- What could go wrong?
- What can I do to prevent it?
- How can we reduce the consequences if an accident nevertheless occurs?

In the case of experimental work, you must produce a safe job analysis (SJA) and have it approved *before* work in a laboratory or workshop can start. The SJA must be approved by a laboratory engineer or supervisor. You must also receive the necessary instruction in the use of relevant equipment and you will be given an introduction into SJA methodology.

Discuss problems with your course coordinator and supervisor. Remember that actually carrying out the right measures is of course the most important part of health, safety and the environment (HSE) work.

NB! Anyone who is going to carry out experimental work must have completed a mandatory health, safety and the environment (HSE) course. If you have not taken this course, you will not be granted access to laboratories. The HSE course can be taken online and the course must be included in all students' education plans. You can find the course on Canvas under the subject Information page TN | Information page TN.

2.2 Contact with your course coordinator and supervisor

It is important for you, your course coordinator and your supervisor to develop a good working relationship during work on your thesis. This can be achieved through regular meetings in which you present and discuss your work as it develops over time. Students are entitled to five supervision meetings with their course coordinator per semester, as well as supervision meetings with any external enterprise. It is a good rule to have had to write something as a basis for talking to your course coordinator or supervisor. This could, for example, be a status report such as those mentioned in section 2.4.

Students, who in the course of their project, participate in fieldwork, expeditions, inspections, field courses or excursions, must provide contact information to their course coordinator and supervisor. Students who work abroad must familiarise themselves with the brochure '*Safe travelling – Information for students travelling abroad*'.

2.3 Documentation

It is an advantage to start writing your thesis as early as possible. Produce a skeleton outline of your thesis early on. As your work progresses, fill in the different chapters and subchapters with text, etc. While working on your thesis, you may experience periods of frustration when everything looks hopeless. At times like this, it is an advantage to be able to look at subchapters that are nearly finished. By focusing on the end product, your thesis, you can save valuable time and establish a good working relationship between you and your supervisor and course coordinator.

In the beginning, the text will often be fragmented and partly in keyword form. However, it is important that you to write down all of your ideas and thoughts as you go. If you do not, good ideas

can quickly be forgotten. It is also important to keep a journal of conversations with your supervisor, as well as of literature, investigations, experiments and mistakes.

Many students experience 'computer problems', often in connection with large files. You can avoid many potential problems by splitting up files (e.g. one for each chapter) and making regular backups to protect your work.

2.4 Citing sources

To get anywhere with a project, even the greatest scientists in the world of science have to build on other people's work. In other words, you must try to avoid spending time "reinventing the wheel". Therefore, it is important to do a thorough literature search to find out what has already been done in the field you are going to work in.
When it comes to using sources, it is important to distinguish between knowledge and intellectual property.

2.5 What is intellectual property?

The Norwegian Copyright Act LOV-1961-05-12-2 Act relating to intellectual property rights) defines intellectual property as:
"In this Act, intellectual property means literary or artistic works of any kind, that express original and individual creative mental effort, such as:

a) texts of all kind, including of a fictional and non-fictional nature
b) oral presentations
c) stage works, dramatic and musically dramatic, as well as choreographic works, pantomimes and radio dramas
d) musical compositions, with or without text
e) cinematographic works
f) photographic works
g) paintings, drawings, graphics, and similar visual arts
h) sculptures of all kinds
i) construction art, both drawings and models, as well as the construction works themselves
j) tapestries and objects of handicrafts and applied art, both the prototype as well as the work itself
k) maps and drawings and graphic and plastic representations of a scientific or technical nature
l) computer programmes
m) translations and adaptations of the works mentioned above"

For photographic images that are not intellectual property, section 23 applies.

2.6 Using the intellectual property of others

It is important to satisfy the Act's requirements for handling intellectual property and to follow good practice when it comes to references. Infringements in relation to this are very serious and can lead to action being taken for cheating.
The faculty would like to take this opportunity to remind you that when your education plan was approved, you confirmed that you had read and understood the *Regulations relating to Studies and Examinations at the University of Stavanger*. Section 6-1 of the *Regulations relating to Studies and Examinations at the University of Stavanger* states, among other things, that cheating is considered

to include quoting sources in an assignment without using quotation marks, italics or other methods to indicate that the text is a quotation and using sources in written work without adequate references.

Using other people's intellectual property means reproducing it directly or in a reworked form in your thesis. How you can do this correctly, depends on your situation:

You are not going to publish your thesis on the internet:
Universities and university colleges in Norway have signed the so-called Kopinor Agreement. If you are not going to publish your thesis on an open network, you can use other people's intellectual property in your thesis without having to obtain permission from the copyright holder.
This is contingent on you providing accurate references to your sources and complying with the citation rules.

You are going to publish your thesis on the internet:
If you, for example, are working on a master's thesis and wish to make this available in the database Brage, or you are working on a thesis that you want to make available on an open network in some way, you must obtain permission to use other people's intellectual property. This will, for example, apply in the case of images or drawings that you find on the internet. You must also provide accurate references in your thesis.
When it comes to intellectual property in the form of text, it is sufficient to comply with the citation rules. More about this below.

It is, therefore, important that it is clearly evident in your thesis what your contribution is and what has been taken from sources.
If you have used text written by someone else, the reader must be made aware of this. This could be text that, for example, has been taken from an article, a book, a bachelor's thesis or a site you found online. Formulations such as "This section was largely taken from…" or "This section was inspired by the…" can be used.

- If you use another author's text word for word, the text must be in quotation marks and followed by the source in brackets. The source must also be stated in the reference list.
- If you write something another author has written in your own words, you must also provide the source, both in the text and in the reference list.
- You do not need to cite the source when writing about general knowledge/known facts.

If you use tables or figures that are wholly or partially based on other people's intellectual property, you must provide references in the table or figure text.
Note sources as you go . It is often difficult to track them down later.

Reference management applications like Zotero and EndNote can be used to keep track of your sources and for the work on citations and the reference list.

How you can set up the thesis and create a reference list is shown in the next chapter.

3. The thesis

3.1 General requirements

Bachelor's and master's theses can take very different forms. Many projects include construction or experimental work, while others focus more on theory. A project could involve producing a collated

overview of a topic from scattered literary sources, a more exhaustive assessment project or a project in which you solve a specific problem or develop a product.

Generally, the thesis must have a clearly defined message, be well structured, clear and easy to read. The arguments in favour of and against a given statement must be presented logically. **A fellow student with the same background should be able to read your thesis without requiring extra information to understand it.**

Recitations of textbooks or similar about general theory and knowledge must be limited. The thesis must also contain a complete reference list.

Since projects differ so much, it is difficult to establish a common template for execution and reporting. Normally, a project will result in a thesis. An example thesis structure is provided below. It must be stressed that this is only one example and modifications will often need to be made. The individual departments may have their own examples or requirements concerning structure. Discuss with your course coordinator how your project must be carried out and documented.

This notwithstanding, many theses will have a fairly similar general structure.

- First comes an introduction explaining the background and purpose of the thesis and its contents.
- Next comes an overview of relevant theory, existing methods and models relevant to the project, laboratory set-up, etc.
- This is followed by a presentation of the analyses/experiments/developments that have been carried out and their results. For non-experimental projects the results may involve (further) development of principles, methods and models.
- A discussion of the results obtained should be included. How do they relate to existing theory, methods and models?
- What conclusions can be drawn?

3.2 Structuring a thesis

As mentioned, here is an example of how a thesis can be structured. Guidelines on the **use of sources** are provided as part of the example. **It is important to read it carefully!**

Example structure:
Front page: The front page must state the title of your thesis, author, date/year, field of study, and name of the institution (University of Stavanger and any collaborating enterprise/institution). Remember that the form Front Page for Bachelor's Theses or Front Page for Master's Theses must be completed and be page 1.

Abstract: The abstract must be able to be read independently of the rest of thesis. It should provide a brief presentation of the problem and outline the work that has been carried out. The main results and important conclusions should also be included. A lot of work should be put into writing a good abstract because this is what most people will read. The abstract should be short.

Table of contents: This presents the various chapters and subchapters with page numbers. If your thesis contains a lot of symbols and abbreviations, you can create a separate list of these after the table of contents.

Acknowledgements: If you wish to thank institutions and/or people who have been very helpful during work on thesis, this can be done in the acknowledgements. You can use the first-person singular, 'I…', in acknowledgements. This is usually avoided in the actual thesis.

Introduction: The introduction can consist of multiple sections. It should start with a short presentation of the background for the thesis, e.g. why it is important to examine the problem. You should also describe what the thesis is about, what has been done and how the report is structured.

Theory: Status of the field, i.e. what has already been done. Normally, you should then assess alternative methods and components/equipment and present the arguments in favour of the choices you have made. In this chapter you also outline the theories, methods, models, equations, etc. that are relevant to the thesis. Remember to tell the reader of the thesis where you obtained the information. Include the sources in both the text and the reference list.

Experiments: List the equipment you have used (preferably in the form of figures) and what chemicals or other inputs were involved, as well as the experimental methods you used. You should also include your methods for literature searches, interviews, methodology and model development, etc.

Results: Here, you should present all of your results. What was the outcome of the experiments, analyses, literature searches and interviews? What kind of method or model did you arrive at? Calculations and any estimates of the uncertainty associated with the results can be included here. It is a good idea to use tables (with text above) and figures (with text below). In the text, **all** tables and figures must be referred to with necessary explanations. The inclusion of precisely these tables and figures must appear logical to the reader. Refer to formulas, models and literature in the theory section. In many cases it is natural to discuss and comment on the results on an ongoing basis. In these circumstances, you should merge the Results and Discussion chapters.

Financial overview: The thesis must include a financial overview of the materials actually consumed. If the thesis describes a product that is meant to be able to be produced, including the costs of mass producing it will also be relevant.

Environmental accounts: Almost everything we do and make has an impact on the environment. Even a computer programme can require a large amount of resources in the form of computing power and electricity consumption (e.g. cryptocurrency mining). The thesis must contain an overview of what sort of impact what has been done could have on the environment. Describe how the product will be recycled. Here, you can also include any *environmental savings* if the results are intended to replace existing solutions.

Discussion: This is where you assess and interpret your results. Feel free to compare your findings to other available results. Discuss possible sources of error and the implications of these. One of the hallmarks of a good thesis is a thoughtful discussion. The discussion must focus on significant results and observations. Avoid giving the impression that you have solved every single detail. Be honest – do not try to hide your mistakes and simplifications underway that you later found to be unfortunate. Instead, explain why you chose the simplifications and comment on them.

Conclusion: Provide a brief summary of the results in your thesis and what they can tell us. Conclusions can often also be integrated in the chapters Results, Discussion or Abstract.

References: It is important to quote others correctly and produce a reference list free of errors to avoid any suspicion of cheating by plagiarism.

A reference list is a list of books, articles, manuals, websites, etc. that you have used in the thesis. The way you write the reference is called a 'style'. There are a great number of styles. Ask your course coordinator what style you should use. You can find good examples of styles in Kildekompasset (http://kildekompasset.no) and in Søk og skriv (https://sokogskriv.no/kjeldebruk/)

Appendices: Appendices are detailed, delimited parts of the thesis that it can be useful to include. Examples of this could be a particular theory concerning elements of the thesis question or a presentation of raw data from parts of the experiments that have been performed (e.g. detailed calculations and deductions, programme printouts, flow charts, file descriptions or chemical data). Tables and figures should be placed in the text where they naturally belong. Alternatively, some of them can be placed in appendices. It is a requirement for both tables and figures that they should be comprehensible and provide clear information without the reader having to obtain information from elsewhere in the thesis.

3.3 A bit about literature searches

In the University Library you can learn how to use databases containing the literature that has been written on the topic you are working on. These databases are of a high standard and the literature you will find here is of a high quality. If you do not find the literature you need in the library, they will borrow it for you from another library. The University Library is part of a large national and international network of libraries.

The University Library offers a large number of courses. In the spring semester, many user courses/workshops are arranged for students working on projects. If you participate in one of these courses, you will receive advice on how to find the literature you are hunting for.

A course in Zotero (both for bachelor's and master's students) or in EndNote (for master's students) is also recommended. Zotero and EndNote are used to keep track of your sources. The applications communicate with Word and help you quote other people correctly and produce a reference list free of errors. If you are writing in LaTeX, we also arrange a course in this.

An overview of the University Library's courses can be found here: Thesis writing | University of Stavanger (uis.no)

If you are stuck, you can book an appointment with a librarian who will help you get started on literature searches: https://www.survey-xact.no/LinkCollector?key=DHDLRF3H3J9J

The University Library offers both courses and individual advice on academic writing. An overview of future courses can be found in the University Library's course calendar. If you want individual advice on writing academic papers, you can contact the Study Lab (studieverksted@uis.no). The Study Lab is open to all students at the University of Stavanger, irrespective of their course and level. More information about the Study Lab's services and opening hours can be found here.

The University Library also has useful resources that can help you with academic writing. Here you will find, for example, the University Library's Canvas page on academic writing and a podcast on academic writing with good tips on writing theses and studying techniques.

The Learning Support Centre offers individual guidance to students at the University of Stavanger who face particular challenges: https://www.uis.no/nb/lss

3.4 Language

Always keep the reader in mind:

- Who are you writing for? We recommend that you write for someone on the same level as you but without the same experience and knowledge specific to this thesis. Adjust your vocabulary based on the reader.
- Wherever possible, use concrete and familiar words.
- Do not use words and letters indiscriminately.
- Explain technical terms and other difficult words. Stay focused on the matter at hand:
    - Divide up the text based on the main points.
    - Make one point at a time.
    - Use conjunctions (and, or, because, etc.) deliberately. These show the connections in the text.
    - Remember to explain abbreviations the first time they are used.
    - For example, in mathematical presentations is it important to use the same notation throughout the thesis.
- To write is to think. Are your thoughts being understood? Think about the text:
    - Guard against abstract formulations.
    - If you are not satisfied, try to rephrase.
    - Chew over your sentences. Read them aloud.
    - Ask others for advice on the language in your thesis.
- Get help with proofreading. Further advice:
    - Write in complete sentences. Normally, one does not use the first person singular form.
    - Split up long, convoluted sentences. There is no shame in using full stops.
    - Placing the verb near the start of a sentence can be a good idea.
    - Use the active voice where appropriate.
- Use up-to-date dictionaries and other spelling books. Remember:
    - Stick to the official writing rules.
    - Remember to weed out English word-divisions (e.g. lamme lår, ananas biter) when you write in Norwegian.
    - Use Norwegian words, not English, when you write in Norwegian.
- Finally, remember that “to write is to connect with others”.

You can find more about language usage on the Language Council of Norway’s website: http://www.sprakrad.no.

4. Submission

Before you submit your thesis, it is important to carry out the following checks:

- As you finish the various chapters, submit them to your programme coordinator for review in good time before the deadline. It can also be a good idea to have others proofread your thesis.
- Check that the page numbers and source references match.
- Check that all references, tables and figures are included, and that they are correctly reproduced and referred to.

Take particular care when checking that the front page, abstract, acknowledgments and table of contents do not contain errors or anything that is unclear. For other submission requirements, please refer to section 3 of the Regulations for Bachelor's and Master's Theses.

5. Thesis assessments

5.1 General system

An external examiner will be appointed based on the course coordinator's recommendations. Grades are set by jointly by the examiner and the course coordinator. Assessment deadlines are specified in table 1.

5.2 Bachelor's theses

(All text in italics has been obtained directly from the National Council for Technological Education (NRT))

5.2.1 Descriptions of Grades and Assessment Criteria for Bachelor's Theses in Engineering

Descriptions of Grades and Assessment Criteria for Bachelor's Theses in Engineering is prepared by the National Council for Technological Education (NRT). The descriptions are completed according to the Norwegian National Qualifications Framework for Higher Education and the National Curriculum Regulations for Engineering Education laid down by the Ministry of Education and Research on 3 February 2011. The descriptions are used for all bachelor's theses in engineering in accordance with this curriculum, starting spring 2014.

Grade/	***Level:***	***Description:***
A	*Excellent*	1. *Excellent work which is clearly outstanding and is characterised by:* 2. *The candidate has extremely good insight into engineering and demonstrates engineering expertise at an outstanding level.* 3. *The candidate is able to select and apply relevant scientific theories and methods at an outstanding level.* 4. *The candidate is able to produce an outstandingly relevant and clear approach to the issue addressed and has planned and executed an extremely high quality piece of engineering work.* 5. *This is an advanced and/or innovative contribution. The analysis and discussion have an extremely good scientific foundation and justification and are clearly linked to the topic that is addressed. The candidate demonstrates extremely good critical reflection and distinguishes clearly between his/her contribution and the contributions from others.* 6. *The form, dissemination, structure and language are at an extremely high level.*
B	*Very good*	1. *Very good work that is characterised by:* 2. *The candidate has very good insight into engineering and demonstrates a very good level of engineering expertise.* 3. *The candidate is able to select and apply relevant scientific theories and methods at a very good level.* 4. *The candidate is able to produce a very relevant and clear approach to the issue addressed and has planned and executed a high quality piece of engineering work.* 5. *This is a very good and/or innovative contribution. The analysis and discussion have a very good scientific foundation and justification and are clearly linked to the topic that is addressed. The candidate demonstrates very good critical reflection and distinguishes clearly between his/her contribution and the contributions from others.* 6. *The form, dissemination, structure and language are at a very high level.*

C	*Good*	1. *Good work that is characterised by:* 2. *The candidate has good insight into engineering and demonstrates a good level of engineering expertise.* 3. *The candidate is able to select and apply relevant scientific theories and methods at a good level.* 4. *The candidate is able to produce a relevant and generally clear approach to the issue addressed and has planned and executed a good quality piece of engineering work.* 5. *The thesis is considered good with elements that are creative. The analysis and discussion have a good scientific foundation and are relevant to the issue that is addressed. The candidate demonstrates good critical reflection and generally distinguishes between his/her contribution and the contributions from others.* 6. *The form, dissemination, structure and language are at a good level.*
D	*Satisfactory*	1. *Clearly acceptable work that is characterised by:* 2. *The candidate has satisfactory insight into engineering and demonstrates a satisfactory level of engineering expertise.* 3. *The candidate is generally able to apply relevant scientific theories and methods.* 4. *The candidate is able to produce a fairly relevant and clear approach to the issue addressed. However, the objectives could have been defined more clearly. The planning and execution result in a piece of engineering work at a satisfactory level.* 5. *The thesis is considered satisfactory. The analysis and discussion have a good scientific foundation and are relevant to the issue addressed but there is potential for improvement. The candidate demonstrates critical reflection and has some problems distinguishing between his/her contribution and the contributions from others.* 6. *The form, dissemination, structure and language are at an acceptable level.*
E	*Sufficient*	1. *Work that is acceptable as it satisfies the minimum criteria and is characterised by:* 2. *The candidate has sufficient insight into engineering and demonstrates a sufficient level of engineering expertise.* 3. *The candidate is only just about able to apply relevant scientific theories and methods.* 4. *The candidate has an adequate approach to the issue addressed. The objectives are described but are unclear. The planning and execution result in a piece of engineering work at an acceptable level. However the candidate shows limited scientific progress and requires close supervision.*

		5. *This is a limited and fragmentary contribution. The analysis and discussion have adequate scientific foundation but should have more closely tied to the issue addressed. The candidate demonstrates a sufficient level of critical reflection but has problems distinguishing between his/her contribution and the contributions from others.* 6. *The presentation is generally acceptable but has clear deficiencies in terms of form, dissemination, structure and language.*
F	*Fail*	1. *Work that does not meet the minimum criteria and is characterised by:* 2. *The candidate does not have the necessary insight into engineering and has an inadequate level of engineering expertise.* 3. *The candidate lacks the competence to apply relevant scientific theories and methods.* 4. *The candidate does not have the ability to adequately address the issue. The objectives are neither clearly defined nor described. The planning and execution of the work is not acceptable.* 5. *This is a very limited and fragmentary contribution. The analysis and discussion have an inadequate scientific foundation and are loosely tied to the issue addressed. The candidate demonstrates an insufficient ability for critical reflection and fails to distinguish between his/her contribution and the contributions from others.* 6. *The presentation has significant deficiencies in terms of form, structure and language.*

Detailed description of the above assessment criteria for bachelor's theses in engineering. The term work refers to the written thesis and any products, if relevant, as well as the oral presentation, if relevant.

1. ***General impression***

Overall impression: *Overall impression of the work.*
Independent work: *To what extent has the candidate generated important elements/issues/ideas in the work himself or herself? Is the candidate able to work independently to find and use relevant literature and methods, and complete an independent research or development project with supervision? Has personal initiative been demonstrated? What type of help and guidance has the candidate received during the various phases of the work? Has the candidate demonstrated the ability to take advantage of the scientific expertise available in the department and apply it in his or her own work?*
Level: *Assessment of each criterion is done in accordance with the bachelor's degree in engineering.*
Time: *A precondition for the assessment of the work is that it has been submitted within the normal allocated time.*

2. ***Insight into engineering***

Is the candidate's grounding in engineering adequately described? Is the work placed in a comprehensive system perspective and demonstrates for example life cycle, environmental, health, societal, economic and ethical perspectives? To what degree can the candidate update his/her knowledge in the area through information searches, as well as contact with the scientific expertise and practical work experience?

3. ***Theoretical insight***

To what degree does the work document a good theoretical overview, specialisation within an area of engineering theory as well as knowledge about relevant research and development, methods and approaches?

4. ***Execution***

Description of objectives: *To what degree is the issue addressed? Is the background and objectives expressed in a clear and understandable manner?*
Level of skill: *To what degree does the work document the ability to plan and execute a piece of engineering work (projects, assignments, experiments)? To what degree is there documentation of the ability to collect, to assess, to use and to refer to information and scientific material with relevance to the issue addressed?*

5. ***Results***

Results: *To what degree does the work build on earlier experimental or development work? Does the work demonstrate quality and creativity, and does it contribute to innovation or realization of products, systems or solutions that are sustainable and useful for society?*
Analysis and discussion: *To what degree is the analysis and discussion scientifically grounded and clearly related to the issue addressed? To what degree is the evaluation of the results based on a methodical approach?*
Reflection: *To what degree is there a reasonable assessment of the significance of the results? Is the candidate critical to various information sources? Does the candidate evaluate and discuss elements of uncertainty such as methodological errors, data errors, etc.? Are relevant ethical issues connected to science, the profession, societal aspects and research analysed?* ***Own contribution/achievements:*** *To what degree has the candidate been able to distinguish between his/her contribution and the contributions from others (source identification and clear referencing)? To what degree does the conclusion present how far the objectives were reached? Is there a reasonable and substantiated recommendation for further work, dissemination, implementation or application of the results?*

6. Presentation

Structure: Is there a logical and structural form in the written work? Is the work generally well-arranged? Is a consistent style used for references, figures and tables? Form and communication: To what degree is the issue and the results communicated with the required academic and linguistic precision? To what degree is the thesis readable with suitable linguistic quality? What is the quality of the figures and tables? What is the quality of the product, if applicable? What is the quality of the oral presentation, if applicable?

The connection between the sum of points and the grade (this uses the same scale as recommended for the assessment of master's theses in MNT subjects):

A: 90-100 points
B: 80-89 points
C: 60-79 points
D: 50-59 points
E: 40-49 points
F: 0-39 points

5.2.2 Bachelor's thesis in natural sciences

For bachelor's theses in natural sciences, the Faculty of Science and Technology uses the same descriptions of grades and assessment criteria for examiners as those used for bachelor's degrees in engineering, with the exception of the requirements for professional insight into engineering. See section 5.2.1.

5.2.3 Facts about grading

If two or more students cooperate on an assignment, they are collectively responsible and receive the same grade. If an oral presentation/examination constitutes a part of the final grade, it may be possible to grade individually. The student may request a written justification of the assessment.

5.3 Master's theses

5.3.1 About descriptions of grades for master's theses

In 2012, the National Faculty meeting of Natural Sciences (NFmR) and the National Council for Technological Education (NRT), decided on new common grade descriptions for Master theses in mathematics, natural sciences and technology subjects (MNT). These will apply to master's theses submitted as of the spring semester 2014. Descriptions of grades are documented in the following guide:

1. *Descriptions of Grades for Master's Theses*
2. *Examiner Assessments, which is a guide for examiners and course coordinators and explains the criteria used in 1.*
3. *Supervisor Assessments, which is a guide for course coordinators and supervisors dealing with the criteria associated supervising a master's thesis.*

** NFmR and NRT are strategic academic units under Universities Norway (UHR).*

All of this has been added here to show what is given weight when assessing your theses.

5.3.1 Using the grade 'A'

As far as grading master's theses is concerned, the Faculty of Science and Technology has, as is known, approved the following resolution concerning the use of the grade 'A':
"The grade 'A' must be accompanied by a brief justification from the examiners to the head of department that provides an account of the originality and publishability."

5.3.2 Descriptions of grades for master's theses

The criteria for achieving the various grades are presented in the table below. (*All text in italics has been obtained directly from the Norwegian text for NFmR and NRT.*)

Grade/	***Level***	***Description***
A	*Excellent*	***- An outstanding thesis which clearly demonstrates a talent for research and/or originality, in a national perspective.*** *- The candidate has very good insight into the scientific theory and methods in his/her field and has demonstrated scientific knowledge at a very high level. The objectives of the thesis are well defined and easy to understand.* *- The candidate is able to select and apply relevant scientific methods convincingly, has all the technical skills required for the work,* *can plan and conduct very advanced experiments or computations without help and works very independently.* *- The thesis is considered very extensive and/or innovative. The analysis and discussion have an extremely good scientific foundation and justification and are clearly linked to the topic that is addressed. The candidate demonstrates extremely good critical reflection and distinguishes clearly between his/her contributions and the contributions from other.* *- The form, structure and language in the thesis are at an extremely high level.*
B	*Very good*	***- A very good thesis that is clearly and positively distinguishable.*** *- The candidate has very good scientific knowledge and insight into the scientific theory and methods in his/her field. The objectives of the thesis are well defined and easy to understand.* *- The candidate is able to select and apply relevant scientific methods soundly, has almost all the technical skills required for the work, can plan and conduct advanced experiments or computations without help, and works very independently.* *- The thesis is considered extensive and/or innovative. The analysis and discussion have a very good scientific foundation and justification and are clearly linked to the topic that is addressed. The candidate demonstrates very good critical reflection and distinguishes clearly between his/her contributions and the contributions from others.* *- The form, structure and language in the thesis are at a very high level.*

C	*Good*	***- A good thesis.*** *- The candidate has good scientific knowledge and insight into the scientific theory and methods in his/her field. The objectives of the thesis are generally well defined but may contain some inexact formulations.* *- The candidate uses the relevant scientific methods satisfactorily, has most of the technical skills required for the work, can plan and conduct quite advanced experiments or computations without help, and works independently.* *- The thesis is considered good with elements that are creative. The analysis and discussion have a good scientific foundation and justification and are linked to the topic that is addressed. The candidate demonstrates good critical reflection and usually distinguishes clearly between his/her contributions and the contributions from others.* *- The form, structure and language in the thesis are at a good level.*
D	*Satisfactory*	***- A satisfactory thesis.*** *- The candidate has quite good scientific knowledge and insight into the scientific theory and methods in his/her field. The objectives of the thesis are defined but may contain some inexact formulations.* *- The candidate is generally able to apply relevant scientific methods, has the main technical skills required for the work, and can plan and conduct experiments or computations without help. The candidate works independently to some extent but needs quite close supervision to achieve satisfactory scientific progress. The candidate may have problems utilising the research group's expertise in his/her own work.* *- The thesis is considered satisfactory. The analysis and discussion have a satisfactory scientific foundation and justification, and are linked to the topic that is addressed, but there is room for improvement. The candidate demonstrates his/her ability for critical reflection but has problems distinguishing clearly between his/her contributions and the contributions from others.* *- The form, structure and language in the thesis are at an acceptable level.*

E	*Sufficient*	***- A thesis that is acceptable and satisfies the minimum criteria.*** *- The candidate has sufficient scientific knowledge and insight into the scientific theory and methods in his/her field. The objectives of the thesis are described but are vague and imprecise.* *- The candidate is able to apply some relevant scientific methods, has a minimum of technical skills required for the work, and can plan and conduct simple experiments or computations without help. The candidate achieves limited scientific progress without close supervision and has problems utilising the research group's expertise in his/her own work.* *- The thesis is considered limited and somewhat fragmented. The analysis and discussion have an adequate scientific foundation and justification, but ought to have had a better link to the topic that is discussed. The candidate demonstrates sufficient critical reflection but may have problems distinguishing between his/her contributions and the contributions from others.* *- The thesis is mostly acceptable, but has definite shortcomings with respect to form, structure and language.*
F	*Fail*	***- A thesis that does not satisfy the minimum requirements.*** *- The candidate does not have sufficient scientific knowledge and insight into the scientific theory and methods in his/her field. The objectives of the thesis are not clearly defined or are lacking.* *- The candidate demonstrates a lack of competence in the use of scientific methods, does not have the required technical skills and independence for the work, and has scarcely utilized the research group's expertise in his/her own work.* *- The thesis is considered very limited and fragmented. The analysis and discussion do not have an adequate scientific foundation and justification and are loosely linked to the topic that is discussed. The candidate does not demonstrate sufficient critical reflection and does not clearly distinguish between his/her contributions and the contributions from others.* *The thesis has major shortcomings with respect to form, structure, and language.*

The student may request a written justification of the assessment.

5.3.3 Examiner assessments

The list below is used by examiners and course coordinators to assess the extent to which you achieved the goals described. The various goals are shown in the table in section 6.3.3 and the text below provides a more detailed description of these.

(All text in italics has been obtained directly from the Norwegian text for NFmR and NRT. Words and concepts that have been underlined have been obtained and translated from the Norwegian version of the National Qualifications Framework.)

Provide an assessment for the criteria below for the extent to which the student has achieved the goals described.

Technical grounding
Is the theoretical and technical foundation clearly described, enabling the work to be placed in the context of relevant international research?

Theoretical insight
Does the work, in particular the introduction, document that the candidate has advanced knowledge of relevant general theory and methods, and particular in-depth insight into the specific field that is applicable to the thesis?

Goal description
Are the project's goals and/or hypotheses presented in a clear and comprehensible manner?

Level of skill
Does the candidate master relevant methods and use these in the thesis in an applicable and integrated manner?

Project result
Does the work demonstrate creativity and/or contribute to new thinking/creativity? Does the work appear to be particularly extensive or comprehensive? What can be said about the quality and significance of the new knowledge / results generated by the work?

Analysis and discussion
Is the analysis, interpretation/synthesis and discussion technically grounded and supported and clearly linked to the problem/topic of the project? Does the discussion maintain a high academic standard? Is the candidate able to apply his/her knowledge and skills to new fields and place the results in a broader perspective?

Critical reflection
Does the candidate demonstrate a reasonable understanding of the value of the results? Does the candidate approach sources of information in a critical manner? Does the candidate evaluate and discuss elements of uncertainty such as methodological errors, data errors, etc.? Does the candidate analyse relevant ethical questions related to technical, professional and research matters?

Own contribution/achievement of goal
Does the candidate make a clear distinction between his/her own work and contributions from others? Does the written project reach a conclusion where the results are summarised satisfactorily, including a discussion of the extent to which goals have been attained? Does the candidate make and justify a reasonable suggestion for further developments or discuss future potential?

Structure
Does the work demonstrate an organised structure (normally 'IMRaD: Introduction, Methods, Results and Discussion')? Is the work generally clear?
Language
Is the candidate able to present problems and results with the necessary technical/academic precision? Is the work easily comprehended and does the candidate demonstrate a good command of the language used?

Form
Is a consistent style used for references, figures and tables? Is the quality of figures and tables acceptable? Does the candidate have a good command of relevant specialist terminology?

5.3.4 Supervisor assessments

Supervisor Assessments is a document for course coordinators and supervisors dealing with the criteria associated supervising a master's thesis. In other words, these are additional criteria that course coordinators and any supervisor use in assessments.

(All text in italics has been obtained directly from the Norwegian text for NFmR and NRT. Words and concepts that have been underlined have been obtained and translated from the Norwegian version of the National Qualifications Framework.)

Provide an assessment for the criteria below for the extent to which the student has achieved the goals described.

Theoretical insight
Has the candidate himself/herself generated important elements/problems in the thesis? Has the student used relevant resources (databases, etc.) to acquire current and updated literature and background knowledge for the work?

Level of skill
Does the candidate master relevant methods and use these in the thesis in an applicable and integrated manner?

Working methods
Does the candidate demonstrate the ability to work systematically and methodically?

Effort
Does the candidate demonstrate the ability to put in a high level of effort and a sound level of professional dedication?

Independence

Can the candidate work and use relevant methods independently, and perform an independent research or development project under supervision? Has personal initiative been demonstrated? What type of help and guidance has the candidate received during the various phases of the work? Has the candidate demonstrated an ability to benefit from the expertise of the research community in his/her own work?

Project result

Does the work demonstrate creativity and/or contribute to new thinking/creativity? Does the work appear to be particularly extensive or comprehensive?

Time

A precondition for the assessment of the work is that it has been submitted within the normal allocated time.