

Assessment Guidance Master's Theses at the Department of Physics

Relevant for the following programs

- MTFYMA
Master's Degree in Applied Physics and Mathematics (1 semester - 30 ECTS)
- MTNANO
Master's Degree in Nanotechnology (1 semester - 30 ECTS)
- MSPHYS
Master's Degree in Physics (2 semesters - 60 ECTS)
- MLREAL
Master's Degree in Natural Science with Teacher Education (1 semester - 30 ECTS)

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Assessment Form (available in Excel format [here](#))

Main Assessment criteria	Sub-assessment criteria	E/I	Weight	Score E	Score I	Weighted score	Comments
Introduction and theory	Academic foundation:	E	5				
	Theoretical insight:	E	8				
	Description of objectives:	E	3				
	Personal contribution:	I	5				
Methods and working practice	Skill level:	E+I	10				
	Working methods:	I	3				
	Effort:	I	5				
	Degree of independence:	I	8				
Results and discussion	Results:	E+I	10				
	Analysis, discussion, and conclusion:	E	15				
	Critical reflection:	E	6				
	Personal contribution/achievement:	E	6				
Presentation	Structure:	E	5				
	Language:	E	6				
	Form:	E	5				
		SUM	100				

- "E" means External Examiner. "Score E" = External examiner's score.
- "I" means internal examiner (cannot be supervisor). "Score I" = Internal examiner's score.
- The supervisor's assessment makes the foundation for the following sub-assessment criteria: "Personal contribution", "Skill level", "Working methods", "Effort", "Degree of independence", and "Results".
- Score from 0 to 100%. See grading table "Letter grades and scores". See appendix for description of letter grades.
- Weighted score = Weight x Score

How to use the Assessment Form

Please note that this is not the final censor form. The final censor form for the relevant candidate is attached.

Weights and scores:

The Faculty of Natural Sciences and Technology has determined weights for each sub-criterion. The weights of all criteria add up to 100. The maximum weighted score is 100.

Assessment:

External and internal examiner make assessments and score the respective sub-criteria. ("E": assessed by external examiner; "I": assessed by internal examiner. Both examiners have joint responsibility for the sub-criteria "Skill level" and "Results".)

Letter grades and scores:

Grade	Scores
A	89 - 100
B	77 - 88
C	65 - 76
D	53 - 64
E	41 - 52
F	0 - 40

Master's Exam

The study programmes **Master's Degree in Physics (MSPHYS)** requires a **Final Master's Exam**.

The Final Master's Exam should take place **no later than one month after the thesis is submitted**. The Exam includes an oral presentation of the thesis followed by a discussion of it. The intention with the Final Master's Exam is to assess how the candidate masters the thesis contents.

- 1) **Oral presentation of the thesis:** the presentation is compulsory and must be judged to passed/not passed. If the presentation is judged to not passed, a new presentation must be conducted. In practice; doing the oral presentation qualifies it to be judged as passed.
-This part is open for all who wants to attend.
- 2) **Thesis discussion:** the discussion that follows the presentation is an oral exam and the censor committee may adjust the sub-criteria scores in the assessment form (up or down)
-This part is **not** open for all who wants to attend.

*The study programmes Master's Degree in Natural Science with Teacher Education (MLREAL), Master's Degree in Applied Physics and Mathematics (MTFYMA) and Master's Degree in Nanotechnology (MTNANO) **do not have** a Final Master's Exam.*

External examiner's assessment of master's theses

For each criterion, the external examiner is to assess the candidate's attainment of the following:

Academic foundation:

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, demonstrate that the candidate has advanced knowledge of relevant theory and methods, and particular in-depth insight into a specific field that is applicable to the thesis?

Description of objectives:

Are the goals and/or hypotheses for the thesis presented in a clear and comprehensible manner?

Skill level:

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

- *The supervisor's assessments make the foundation for the sub-criterion's score.*

Results:

Does the work demonstrate creativity and/or contribute to new thinking? Does the work appear to be particularly extensive or comprehensive? How do you rate the quality and value of the new knowledge/results generated by this work?

- *The supervisor's assessments make the foundation for the sub-criterion's score.*

Analysis, discussion, and conclusion:

Are the analysis, interpretation, and discussion properly founded, justified, and related to the current problem? Is the discussion on a high academic level? Is the candidate able to apply her/his knowledge and skills in new areas and consider the results in a broader context?

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 consider and evaluate factors of uncertainty such as methodological errors, data errors, etc.? Does the candidate analyze relevant ethical questions related to technical, professional, and research matters (if applicable)?

Personal contribution/achievement:

Is the candidate able to distinguish her/his own contributions from others? Does the thesis contain a conclusion where the results are properly summarized, including an evaluation of the goal achievements? Does the candidate make and justify reasonable suggestions for further developments or discuss the potential for such?

Structure:

Does the work demonstrate an organized structure (normally IMRaD: Introduction, Methods, Results and Discussion)? Is the work generally clear?

Language:

Is the candidate able to present issues and results with the necessary technical precision? Is the work easily comprehended and does it demonstrate a good command of the language used?

Form:

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

Internal examiner assessment of master's theses

For each sub-criterion, the internal examiner is to assess the candidate's attainment of the following (*The supervisor's assessments make the foundation for the sub-criteria scores*):

Personal contribution:

Assess the candidate's work in relation to:

- The candidate has generated important elements/problems addressed in the thesis.
- The candidate uses current and updated literature and background knowledge for the work.

Skill level:

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 in a planned and methodical manner?

Effort:

Does the candidate demonstrate a high degree of effort and motivation?

Degree of independence:

Is the candidate able to work and use relevant methods in an independent manner, and conduct an independent piece of research or development under supervision? Does the candidate show personal initiative? What type of help and supervision has the candidate received during the different phases of the work? Is the candidate able to draw on the expertise of the research group and apply this to his/her own work?

Results (work):

Does the work demonstrate creativity and/or contribute to new thinking? Does the work appear to be particularly extensive or comprehensive? How do you rate the quality and value of the new knowledge/results generated by this work?

Appendix: Descriptions of grades for master's theses

The grading of master's theses in mathematics, natural sciences, and technology is governed by the following descriptions of grades for theses submitted in the spring semester 2014 and later.

Grade/level and Description

A - Excellent

- Excellent work which is outstanding.
- 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 very 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 excellent scientific foundation and justification, and are clearly linked to the topic that is addressed. The candidate demonstrates excellent critical reflection and distinguishes clearly between his/her contributions and the contributions from others.
- The form, structure, and language in the thesis are excellent.

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 utilizing 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 may have 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 utilizing 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 has 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.

References

The Assessment Guidance Master's Theses at the Department of Physics is based on:

Examination Regulations at the Norwegian University of Science and Technology

Chapter 5 Assessment, § 23 Assessment, UTF §23 and Adjustments/Supplements to the UTF §23 (Dean's Decision 10.12.2008 (D-sak 310/08))

"Karaktersetting av masteroppgaver - justering av praksis"

Memo from Pro-Rector Education, 2011/16682

Memo and attachments available here:

<https://innsida.ntnu.no/wiki/-/wiki/Norsk/Karaktersetting+av+masteroppgaver+-+justering+av+praksis> (downloaded May 2014)