

# **2019 guidelines for an MSc-thesis MIL-A**

## **Soil physics and Land Management (SLM)**

### **Course codes: SLM-80318-39**

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**Chair Group: Soil physics and Land Management (SLM)  
Environmental Sciences Group (ESG)  
Wageningen University**

**January 2019**

## 1 Intake procedure

The MSc-intake intake person at the Chair Group Soil physics and Land Management (SLM) is Dr. Michel Riksen. Appointments for an intake meeting can be made by e-mail (Michel.Riksen@wur.nl). The intake should be planned well ahead (**preferably 6 months!**) of the start of your thesis work. For MIL-A the recommended thesis contains 30 ects with an additional 6 ects proposal evaluation (SLM-80336 = 6 months). Workloads ranging from 18 to 39 ects are also possible. Plan your intake by studying the different thesis topics on the TIP website.

There are five steps in the selection of a MSc thesis subject: see ‘How to choose a SLM MSc thesis? Preferably, your thesis work will be integrated in the current research of the SLM Group. Currently there are various subjects described under ‘SLM thesis topics’. Additionally, you can find there thesis opportunities which are described in less detail. Once a year this list is updated, often around the thesis fair that is held annually in January.

During the intake meeting you can express your interest in one or several possibilities and for the time period that you want to carry out your thesis work. Thereafter, Michel will consult SLM staff members or foreign staff members about your interest. They will be asked whether they are willing and able to be your supervisor and can host you in the preferred time. As soon as Michel has received one or more reactions you will be informed by e-mail. You are then invited to make direct contact with one or more possible supervisors. After that you will have to inform Michel in order to finalize the intake procedure. Thereafter you will mainly deal with your supervisor.

## 2 Time table

Students should make a time table including all the milestones that will lead smoothly (without study delay) to one of the five official examination dates. Students for which the thesis mark is the final mark of their Master program should watch the graduation dates which are mentioned in the WUR Study Handbook.

Below you will find an example for a 36 ects thesis that aims at completion in January.

**Table 1:** Time table with milestones leading to a 36 ects thesis

| Milestone                     | Duration (wks) | Finished (wk) |
|-------------------------------|----------------|---------------|
| Start intake                  |                | In P2 (9-14)  |
| Collecting information        |                | In P3 (18-23) |
| Proposal writing              | In WRM-32306   | In P5 (26-31) |
| Proposal evaluation           | 4              | In P5 (34-42) |
| Start execution               | -              | 44            |
| Execution                     | 16             | 10            |
| Finish execution              | -              | 10            |
| Draft thesis + coll. date     | 2              | 13            |
| Final thesis + coll. abstract | 1              | 15            |
| Colloquium                    | 1              | 18            |
| Oral exam                     | 0              | 18            |
| Total                         | 24             |               |

### 3 Thesis contract

The thesis work can be divided in three phases: starting phase, working phase and the rounding-off phase. For a 36 credit thesis (6 months = 24 weeks) orientation, writing the research proposal, presenting and evaluation should take about 4 weeks, the practical work 16 weeks and the final reporting, colloquium and exam 4 weeks. The work has to be finished in time; failure to do so will negatively affect the assessment that is why we require a contract. Such a MSc-thesis contract has to be made up in advance, see [MSc thesis contract](#). The above time table is part of this contract. The contract has to be signed by the student, the supervisor(s) and the examiner and a digital copy sent to the MIL-A study advisor.

The prerequisites for a SLM Master thesis depend on the size of the thesis, the subject and your current knowledge. Usually you agree with your supervisor on specific prerequisites, which will be mentioned in the thesis contract.

With more than one supervisor and in case the second supervisor is from another Chairgroup, the share (in %) of each supervisor must be mentioned in the thesis proposal and in the thesis contract. In that case both supervisors will have to sign the contract. The contract assures that you obtain the supervision that you and your supervisors agreed upon.

After completion of the prerequisites, the signing of the thesis contract and the approval of the research proposal by the supervisor, the student should go to the SLM secretariat ([Rianne.Maasen@wur.nl](mailto:Rianne.Maasen@wur.nl)) to register your personal details (including photograph) and address.

Students from other universities have to register at the Wageningen University for the study year in which research work and the final assessment will be done. The forms can be found on: <http://www.wageningenuniversiteit.nl/UK/education/studentinformation/>.

### 4 Starting phase: research proposal

Table 2 gives a number of activities and products in the starting phase.

**Table 2:** Activities and products in the starting phase.

| Phase    | Activity   | Product   |
|----------|--|---|
| Starting | <ul style="list-style-type: none"><li>• orientation</li><li>• problem analysis</li><li>• literature search</li><li>• work plan</li><li>• presentation</li><li>• evaluation</li></ul> | research proposal with: <ul style="list-style-type: none"><li>• preliminary title</li><li>• context and background (Theory)</li><li>• problem definition</li><li>• research objectives</li><li>• methodology</li><li>• time schedule</li><li>• literature</li></ul> |

The starting phase will end in a research proposal. This should be simple (about 5 pages) but to the point. An example of a Table of Contents and of a full proposal can be found on our website. Only if the supervisor agrees with the proposal the thesis candidate can continue with the execution phase.

During the course WRM-32306 ‘Research Approaches’, MIL students will receive training in a.o. proposal writing in period 5. In period 5 MIL-A students will present their proposal to staff and fellow students and use comments to finalize their proposal.

During the start and the rounding-off phase of your thesis work there will be a workplace for you at the Chairgroup. The workplace is equipped with a PC. To obtain a workplace please address to [Rianne.Maasen@wur.nl](mailto:Rianne.Maasen@wur.nl) as soon as you have signed the thesis contract, so that she can make a planning.

## 5 Execution phase: being guest of your host

Table 3 gives a number of activities and products in the execution phase.

**Table 3** Activities and products in the execution phase.

| Phase     | Activity  | Product  |
|-----------|---|--|
| Execution | <ul style="list-style-type: none"><li>• experiment, field work, model work</li><li>• data gathering &amp; data analysis</li><li>• discussions with host</li></ul> | <ul style="list-style-type: none"><li>• data files</li><li>• data interpretation</li><li>• draft thesis</li><li>• progress reports</li></ul> |

If thesis work is done abroad students have to adapt to working conditions such as institutional hierarchy, ethics, dress code, etc that are often very different from Dutch conditions. During field work the student is seen as a guest of the landowner/land user. This means that before going into the field the student has to contact the landowner/land user to ask him permission to enter his plot.

The use of laboratories and equipment for fieldwork *if available* has to be agreed upon by your supervisor and can be arranged by addressing to Piet Peters ([Piet.Peters@wur.nl](mailto:Piet.Peters@wur.nl)). The supervisor will inform Piet after signing the thesis contract.

During the execution phase the student writes short progress reports to inform his supervisor(s). After finishing the working phase and returning to Wageningen the student inform his/her supervisor immediately.

## 6 Rounding off phase: the thesis

Table 4 gives a number of activities and products in the rounding-off phase.

**Table 4:** activities and products in the rounding-off phase.

| Phase        | Activity  | Product  |
|--------------|---|--|
| Rounding off | <ul style="list-style-type: none"><li>• evaluation/discussion of the results</li><li>• writing up report</li><li>• preparation colloquium</li></ul> | <ul style="list-style-type: none"><li>• thesis report</li><li>• colloquium</li><li>• final oral exam</li></ul> |

The thesis will be finished during the rounding off phase. This should not take more than **2 weeks** since a draft thesis should be made during the execution phase. While writing your thesis keep in mind that the purpose of the thesis is to prove that you are capable of doing original, scientific research. So, organize your work accordingly and don't make it longer than 25-45 pages (depending on your agreement with your supervisor).

- 1 Cover page (see our website)
- 2 Abstract (max 1 page)
- 3 Introduction: problem definition; state-of-the-art; theory/concepts; objectives.
- 4 Material and Methods: How was the problem studied and which theory has been used?
- 5 Results: What were the findings and/or applications?
- 6 Conclusions & recommendations: What do these results mean in the local context and how could somebody else continue? What are (in)direct applications? Critical reflection & ethics/
- 7 Literature & annexes

Examples of previous MSc-thesis can be found on our website. The most common language for your thesis is English. In exceptional cases you are allowed (if your supervisor agrees) to use another language.

When you have a first draft of your thesis ready, ask your supervisor for comments. He/she will usually need 1 week for this proof reading. Only hand in a concept thesis that is complete (e.g. have all chapters and annexes) and that has gone through a spelling checker. After having discussed the comments with your supervisor you have one chance to improve your draft. This may not take more than 1 week. The final

copies have to be submitted to the supervisor at least two weeks before the oral exam (see below). The student should hand in a PDF file.

The task of writing a thesis sometimes lures students into using other's work, ideas, facts, texts, etc and represents it as their own. It is important for students to understand that plagiarism is considered as a very serious offence against academic norms and, hence subject to equally serious punishment.

In case the thesis work is of excellent quality, the supervisor will propose the student to submit the thesis results into a publication in an international refereed journal. Students may receive some compensation for the extra work.

## 7 Colloquium

After the concept thesis report is finished but before the examination the student has to give a colloquium. Reserve a date ***one month in advance*** with your supervisor.

The secretariat will take care of informing interested students to attend your colloquium. Three weeks before the colloquium date an abstract (max. 500 words) including name of the student, date, and title of the thesis has to be sent by the student to the secretariat.

The meaning of the colloquium is that the student gains experience with discussing (right to the point) the research problem, the objectives and the results of the research, and the people that attend can get acquainted with this research. A colloquium will last 20 minutes, is followed by a discussion of maximum 10 minutes. It is strongly advised to have a test colloquium a few days prior to your colloquium. Your performance will be assessed using a form that can be downloaded from our web-site.

Note that each MIL-A student has to attend a ***total number of 6*** student or staff colloquia during their 2-years Master study.

## 8 Assessment: thesis and final exam

Learning outcomes of the MSc-thesis can be found in the study handbook. During the MSc-thesis period there are several evaluation moments for which the standard form "Thesis evaluation Wageningen University" will be used.

The supervisor arranges an oral examination. The examination board exists of the supervisor(s) and one or more staff members. The date of the examination will be fixed during the handing in of the final thesis report. This should be at least two weeks before the examination. The assessment will be related to the four learning objectives:

- general knowledge of the concepts, the methods and the techniques available in SLM science;
- general knowledge on SLM processes in data capture, data analysis and presentation of data;
- ability to recognise, describe and analyse problems in relevant areas (of environmental application);
- ability to propose SLM solutions (conceptually and formally) in a specific or generic way.

In more common sense the student has to proof via the thesis:

- a critical scientifically based interest;
- an innovative interpretation of the thesis problem;
- a self-reliant way of research;
- a dedicated presentation of research results;
- a well motivated defence during the final discussion.

After the examination, before graduation, the student receives an email from the department "Quality of Research and Education" with a link to an electronic inquiry form in order to evaluate the course of the thesis work and the coordination.

The mark of the thesis work is only send to the Central Student Administration (CSA) after approval of the supervisor and when the definitive report (a PDF of the report) has been handed in at the secretariat.

### **9 Rights, duties and complaints**

The student can claim a good and regular supervision. Therefore, clear appointments with the supervisor(s) are made (and written down in the contract) at the beginning of the thesis work.

The student has to deal with the rules and the habits of the Chair Group. The student can use the facilities of the Chair Group, but exclusively in consultation with the supervisor(s) or technician(s).

Supervisors have to be well informed about relevant literature on the thesis subject and have to discuss this with the student. Supervisors will have to take care of the timetable of the student and to look after the progress of the work and when needed to support the student and avoid extension / delay.

Complaints related to the thesis work must be reported to the responsible staff member or the Head of the Chair Group (Coen Ritsema). In all cases eventual problems have to be solved preferentially with the supervisor, before a complaint is sent in.

Against dispositions of examiners an appeal can be lodged as described in the Student Charter: <http://www.wageningenuniversiteit.nl/NR/rdonlyres/E5278AC7-2F63-4AA2-A5AC-7BF75430812B/69659/charter0809chapters.pdf>). The student with complaints can eventually take up contact with the education coordinator (Bert.Bruins@wur.nl) or with the dean's office (see thesis contract).



## Rubric for the assessment of an MSc-thesis proposal: GO/NOGO (derived from the overall rubric) – 1.3

Authors: Arnold F. Moene, Meteorology and Air Quality Group, Wageningen University (v 1.1) / FBE-R. van Lammeren/S. de Bruin (v1.2/1.3)-based on the PC MFN December, 2014, and experiences from many colleague-examiners). Version: 1.1 (December 15, 2010) / Version 1.2 (November 2016)/ version 1.3 (January 2018). This document is released under the Creative Commons Attribution-Non-commercial-Share Alike 3.0 Netherlands License

| Item  | Mark for item  |   |  |   |   |   |
|---|--|---|--|---|---|---|
|   | 1-3  | 4-5   | 6  | 7   | 8   | 9-10  |
| Thesis proposal   |  |   |  |   |   |   |
| <b>1. Research relevance, problem statement</b>               | Absent, not explicitly given                                 | Research need is limited. No clear focus, definitions and delineation   | Societal and scientific embedding is limited and inconsistent  | Societal and scientific embedding is given, but examples and references are limited. Some consistency.  | Societal and scientific embedding is given, with sufficient examples and references.  | Very motivated relevance and problem statement with punctual embedding and fine examples and references.  |
| <b>2. Objective, research questions, hypothesis</b>           | Absent, Vague, unclear                                       | The objective is inconsistent with the problem statement or research questions / hypothesis are not in line with the objective .  | The objective is to a limited extent consistent with the problem statement or research questions / hypothesis are only to a limited extent in line with the objective  | Both The objective is mostly in line with the problem statement and research questions / hypothesis are mostly in line with the objective. However, the set of research questions or hypothesis is insufficient for fully addressing the objective. | The problem statement, objective and research questions or hypothesis are fully consistent and the set of the set of research questions or hypothesis allow reaching the objective. | Not only are problem statement, objective and research questions consistent and the set of research questions complete; there are also innovative aspects in the research questions |
| <b>3 Theoretical, analytical framework, use of references</b> | Absent, not well stated                                      | Proposal includes some theoretical and/or framework concepts and refers to at least 10 scientific references, which are, however, at most weakly related to the research topic. | Proposal includes some theoretical and/or framework notion and refers to at least 10 scientific references which in some cases lack coherence with the research topic. | Proposal includes some theoretical base and/or framework that is supported by at least 10 scientific references, but it could have been focused more.   | Proposal includes a dedicated theoretical base and/or framework supported by a proper set of scientific references.   | Proposal includes a very well and dedicated theoretical base and/or framework supported by meticulously described state-of-the art references.                                      |
| <b>4 Methodology and Use of data</b>                          | Absent or at most roughly indicated                          | Proposal includes some preliminary ideas on how to address the research questions. Data are at most roughly mentioned.  | Proposal describes an existing approach composed of different stages without explicitly naming data and methods.   | Proposal describes an existing approach composed of different stages by, naming methods and data. It lacks a description of methods for assessing the quality of results.   | Proposal describes an approach composed of different stages by providing details on methods and data as well as quality assessment.   | The proposed approach has innovative aspects.   |
| <b>5 Time Schedule, feasibility</b>                           | Absent, too roughly indicated. Feasibility is not addressed. | A rough outline of activities which are not really linked to the methodology. Feasibility is explored to a very limited extent  | Main activities are labelled in time and do have some links to the methodology and other stages of the thesis work. Feasibility is addressed but not fully explored    | Detailed (Gantt chart alike) that shows the different methodological steps. Feasibility items are being addressed in line with the time schedule  | Very detailed (Gantt chart alike) that shows time windows of actions, results and addresses feasibility issues.   | Very detailed (Gantt chart alike) with a critical path .  |

# Rubric for assessment of MSc-thesis

Author: Arnold F. Moene, Meteorology and Air Quality Group, Wageningen University

Version: 1.1 (December 15, 2010)



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| Item   | Mark for item  |   |  |  |  |   |
|--|--|---|--|--|--|---|
|  | 2-3  | 4-5   | 6  | 7  | 8  | 9-10  |
| <b>1. Research competence (30-60%) *</b>   |  |   |  |  |  |   |
| <b>1.1. Commitment and perseverance</b>  | Student is not motivated. Student escapes work and gives up regularly  | Student has little motivation. Tends to be distracted easily. Has given up once or twice  | Student is motivated at times, but often, sees the work as a compulsory task. Is distracted from thesis work now and then.   | The student is motivated. Overcomes an occasional setback with help of the supervisor.   | The student is motivated and/or overcomes an occasional setback on his own and considers the work as his "own" project.  | The student is very motivated, goes at length to get the most out of the project. Takes complete control of his own project. Considers setbacks as an extra motivation.   |
| <b>1.2. Initiative and creativity</b>  | Student shows no initiative or new ideas at all.   | Student picks up some initiatives and/or new ideas suggested by others (e.g. supervisor), but the selection is not motivated.                                       | Student shows some initiative and/or together with the supervisor develops one or two new ideas on minor parts of the research.  | Student initiates discussions on new ideas with supervisor and develops one or two own ideas on minor parts of the research.                                 | Student has his own creative ideas on hypothesis formulation, design or data processing.   | Innovative research methods and/or data-analysis methods developed. Possibly the scientific problem has been formulated by the student.   |
| <b>1.3. Independence</b>   | The student can only perform the project properly after repeated detailed instructions and with direct help from the supervisor. | The student needs frequent instructions and well-defined tasks from the supervisor and the supervisor needs careful checks to see if all tasks have been performed. | The supervisor is the main responsible for setting out the tasks, but the student is able to perform them mostly independently   | Student selects and plans the tasks together with the supervisor and performs these tasks on his own   | Student plans and performs tasks mostly independently, asks for help from the supervisor when needed.  | Student plans and performs tasks independently and organizes his sources of help independently.   |
|  | No critical self-reflection at all.  | No critical self-reflection at all.   | Student is able to reflect on his functioning with the help of the supervisor only.  | The student occasionally shows critical self-reflection.   | Student actively performs critical self-reflection on some aspects of his functioning  | Student actively performs critical self-reflection on various aspects of his own functioning and performance.   |
| <b>1.4. Efficiency in working with data</b><br>Note: depending on the characteristics of the thesis work, not all three aspects (experimental work, data analysis and model development) may be relevant and some may be omitted | <b>Experimental work</b>   | Student is able to execute detailed instructions to some extent, but errors are made often, invalidating (part of) the experiment.                                  | Student is able to execute an experiment that has been designed by someone else (without critical assessment of sources of error and uncertainty).   | Student is able to execute an experiment that has been designed by someone else. Takes sources of error and uncertainty into account in a qualitative sense. | Student is able to judge the setup of an existing experiment and to include modifications if needed. Takes into account sources of error and uncertainty quantitatively. | Student is able to setup or modify an experiment exactly tailored to answering the research questions. Quantitative consideration of sources of error and uncertainty. Execution of the experiment is flawless. |
|  | <b>Data analysis</b>   | Student is able to organize the data, but is not able to perform checks and/or simple analyses  | Student is able to organize data and perform some simple checks; but the way the data are used does not clearly contribute to answering of the research questions and/or he is unable to analyze the data independently. | Student is able to organize the data, perform some basic checks and perform basic analyses that contribute to the research question                          | Student is able to organize the data, perform commonly used checks and perform some advanced analyses on the data  | Student is able to organize the data, perform thorough checks and perform advanced and original analyses on the data.   |
|  | <b>Model development</b>   | Student modifies an existing  | Student is able to make minor  | Student is able to make major  | Student is able to make major  | Student is able to develop a  |



| Item  | Mark for item   |  |  |   |   |   |
|---|---|--|--|---|---|---|
|   | 2-3   | 4-5  | 6  | 7   | 8   | 9-10  |
|   | Student is not able to make any modification/addition to an existing model.   | model, but errors occur and persist. No validation.  | modifications (say a single formula) to an existing model. Superficial validation or no validation at all. | modifications to an existing model, based on literature. Validation using some basic measures of quality.                   | modifications to an existing model, based on literature or own analyses. Validation using appropriate statistical measures. | model from scratch, or add an important new part to an existing model. Excellent theoretical basis for modelling as well as use of advanced validation methods. |
| <b>1.5. Handling supervisor's comments and development of research skills</b> | Student does not pick up suggestions and ideas of the supervisor  | The supervisor needs to act as an instructor and/or supervisor needs to suggest solutions for problems                         | Student incorporates some of the comments of the supervisor, but ignores others without arguments          | Student incorporates most or all of the supervisor's comments.  | Supervisor's comments are weighed by the student and asked for when needed.   | Supervisor's comments are critically weighed by the student and asked for when needed, also from other staff members or students.                               |
|   | Knowledge and insight of the student (in relation to the prerequisites) is insufficient and the student is not able to take appropriate action to remedy this | There is some progress in the research skills of the student, but suggestions of the supervisor are also ignored occasionally. | The student is able to adopt some skills as they are presented during supervision                          | The student is able to adopt skills as they are presented during supervision and develops some skills independently as well | The student is able to adopt new skills mostly independently, and asks for assistance from the supervisor if needed.        | The student has knowledge and insight on a scientific level, i.e. he explores solutions on his own, increases skills and knowledge where necessary.             |
| <b>1.6. Keeping to the time schedule</b>                                      | Final version of thesis or colloquium more than 50% of the nominal period overdue without a valid reason (force majeure)                                      | Final version of thesis or colloquium at most 50% of the nominal period overdue (without a valid reason).                      | Final version of thesis or colloquium at most 25% of nominal period overdue (without valid reason)         | Final version of thesis or colloquium at most 10% of nominal period overdue (without valid reasons)                         | Final version of thesis or colloquium at most 5% of nominal period overdue (without good reasons)                           | Final version of thesis and colloquium finished within planned period (or overdue but with good reason).  |
|   | No time schedule made.  | No realistic time schedule.  | Mostly realistic time schedule, but no timely adjustment of time schedule.                                 | Realistic time schedule, with some adjustments (but not enough or not all in time) in times only.                           | Realistic time schedule, with timely adjustments. of times only.  | Realistic time schedule, with timely adjustments of both time and tasks.  |

2. Thesis report (30-60%) \*

|  |   |  |   |   |  |   |
|--|---|--|---|---|--|---|
| <b>2.1. Relevance research, clearness goals, delineation research</b>  | No link is made to existing research on the topic. No research context is described.                                  | The context of the topic at hand is described in broad terms but there is no link between what is known and what will be researched. | The link between the thesis research and existing research does not go beyond the information provided by the supervisor.   | Context of the research is defined well, with input from the student. There is a link between the context and research questions.   | Context of the research is defined sharply and to-the-point. Research questions emerge directly from the described context.  | Thesis research is positioned sharply in the relevant scientific field. Novelty and innovation of the research are indicated.   |
|  | There is no researchable research question and the delineation of the research is absent                              | Most research questions are unclear, or not researchable and the delineation of the research is weak                                 | At least either the research questions or the delineation of the research are clear   | The research questions and the delineation are mostly clear but could have been defined sharper at some points  | The research questions are clear and researchable and the delineation is clear.  | The research questions are clear and formulated to-the-point and limits of the research are well-defined.   |
| <b>2.2. Theoretical underpinning, use of literature</b>                | No discussion of underlying theory.   | There is some discussion of underlying theory, but the description shows serious errors.   | The relevant theory is used, but the description has not been tailored to the research at hand or shows occasional errors.  | The relevant theory is used, and the description has been tailored partially successful to the research at hand. Few errors occur.  | The relevant theory is used, it is nicely synthesized, and it is successfully tailored to the research at hand.  | Clear, complete and coherent overview of relevant theory on the level of an up-to-date review paper. Exactly tailored to the research at hand.  |
|  | No peer-reviewed/primary scientific papers in reference list except for those already suggested by the supervisor     | Only a couple of peer-reviewed papers in reference list.   | Some peer-reviewed papers in reference list but also a significant body of grey literature.   | Relevant peer-reviewed papers in reference list but also some grey literature or text books. Some included references less relevant.  | Mostly peer-reviewed papers or specialized monographs in reference list. An occasional reference may be less relevant.   | Almost exclusively peer-reviewed papers in reference list or specialized monographs (not text books). All papers included are relevant.   |
| <b>2.3. Use of methods and data</b>                                    | No description of methods and/or data.  | Research is not reproducible due to insufficient information on data (collection and/or treatment) and analysis methods              | Some aspects of the research regarding data-collection, data-treatment, models or the analysis methods are described insufficiently so that that particular aspect of the research is not reproducible. | Description of the data (collection, treatment) or models as well as the analysis methods used is lacking in a number of places so that at most a more or less similar research could be performed. | Description of the data (collection, treatment) or models as well as the analysis methods used is mostly complete, but exact reproduction of the research is not possible due to lack of some details. | Description of the data (collection, treatment) or models as well as the analysis methods is complete and clear so that exact reproduction of the research is possible.   |
| <b>2.4. Critical reflection on the research performed (discussion)</b> | No discussion and/or reflection on the research. Discussion only touches trivial or very general points of criticism. | Only some possible weaknesses and/or weaknesses which are in reality irrelevant or non-existent have been identified.                | Most weaknesses in the research are indicated, but impacts on the main results are not weighed relative to each other.  | Most weaknesses in the research are indicated and impacts on the main results are weighed relative to each other.   | All weaknesses in the research are indicated and weighed relative to each other. Furthermore, (better) alternatives for the methods used are indicated.  | Not only all possible weaknesses in the research are indicated, but also it is indicated which weaknesses affect the conclusions most.  |
|  | No confrontation with existing literature.  | Confrontation with irrelevant existing literature.   | Only trivial reflection vis-a-vis existing literature.  | Only most obvious conflicts and correspondences with existing literature are identified. The value of the study is described, but it is not related to existing research.                           | Minor and major conflicts and correspondences with literature are shown. The added value of the research relative to existing literature is identified.  | Results are critically confronted with existing literature. In case of conflicts, the relative weight of own results and existing literature is assessed. The contribution of his work to the development of scientific concepts is identified. |

|  |  |  |   |  |   |   |
|--|--|--|---|--|---|---|
| <b>2.5. Clarity of conclusions and recommendations</b> | No link between research questions, results and conclusions.   | Conclusions are drawn, but in many cases these are only partial answers to the research question. Conclusions merely repeat results.   | Conclusions are linked to the research questions, but not all questions are addressed. Some conclusions are not substantiated by results or merely repeat results.  | Most conclusions well-linked to research questions and substantiated by results. Conclusions are mostly formulated clearly but with some vagueness in wording.                   | Clear link between research questions and conclusions. All conclusions substantiated by results. Conclusions are formulated exact.  | Clear link between research questions and conclusions. Conclusions substantiated by results. Conclusions are formulated exact and concise. Conclusions are grouped/ordered in a logical way.                              |
|  | No recommendations given.  | Recommendations are absent or trivial.   | Some recommendations are given, but the link of those to the conclusions is not always clear.   | Recommendations are well-linked to the conclusions.  | Recommendations are to-the-point, well-linked to the conclusions and original.  | Recommendations are to-the-point, well-linked to the conclusions, original and are extensive enough to serve as project description for a new thesis project.   |
| <b>2.6. Writing skills</b>                             | Thesis is badly structured. In many cases information appears in wrong locations. Level of detail is inappropriate throughout. | Main structure incorrect in some places, and placement of material in different chapters illogical in many places. Level of detail varies widely (information missing, or irrelevant information given). | Main structure is correct, but lower level hierarchy of sections is not logical in places. Some sections have overlapping functions leading to ambiguity in placement of information. Level of detail varies widely (information missing, or irrelevant information given). | Main structure correct, but placement of material in different chapters illogical in places. Level of detail inappropriate in a number of places (irrelevant information given). | Most sections have a clear and unique function. Hierarchy of sections is mostly correct. Ordering of sections is mostly logical. All information occurs at the correct place, with few exceptions. In most places level of detail is appropriate. | Well-structured: each section has a clear and unique function. Hierarchy of sections is correct. Ordering of sections is logical. All information occurs at the correct place. Level of detail is appropriate throughout. |
|  | Formulations in the text are often incorrect/inexact inhibiting a correct interpretation of the text.                          | Vagueness and/or inexactness in wording occur regularly and it affects the interpretation of the text.   | The text is ambiguous in some places but this does not always inhibit a correct interpretation of the text.   | Formulations in text are predominantly clear and exact. Thesis could have been written more concisely.   | Formulations in text are clear and exact, as well as concise.   | <i>Textual</i> quality of thesis (or manuscript in the form of a journal paper) is such that it could be acceptable for a peer-reviewed journal.  |

| 3. Colloquium (5%) *                        |  |   |   |  |  |  |
|---|--|---|---|--|--|--|
| <b>3.1. Graphical presentation</b>          | Presentation has no structure.   | Presentation has unclear structure.   | Presentation is structured, though the audience gets lost in some places.   | Presentation has a clear structure with only few exceptions.   | Presentation has a clear structure. Mostly a good separation between the main message and side-steps.  | Presentation clearly structured, concise and to-the-point. Good separation between the main message and side-steps.  |
|   | Unclear lay-out. Unbalanced use of text, graphs, tables or graphics throughout. Too small font size, too many or too few slides. | Lay-out in many places insufficient: too much text and too few graphics (or graphs, tables) or vice versa.        | Quality of the layout of the slides is mixed. Inappropriate use of text, tables, graphs and graphics in some places.  | Lay-out is mostly clear, with unbalanced use of text, tables, graphs and graphics in few places only.  | Lay-out is clear. Appropriate use of text, tables, graphs and graphics.  | Lay-out is functional and clear. Clever use of graphs and graphics.  |
| <b>3.2. Verbal presentation and defense</b> | Spoken in such a way that majority of audience could not follow the presentation.  | Presentation is uninspired and/or monotonous and/or student reads from slides: attention of audience not captured | Quality of presentation is mixed: sometimes clear, sometimes hard to follow.  | Mostly clearly spoken. Perhaps monotonous in some places.  | Clearly spoken.  | Relaxed and lively though concentrated presentation. Clearly spoken.   |
|   | Level of audience not taken into consideration at all.   | Level of audience hardly taken into consideration.  | Presentation not at appropriate level of audience.  | Level of presentation mostly targeted at audience.   | Level of presentation well-targeted at audience. Student is able to adjust to some extent to signals from audience that certain parts are not understood.                          | Clear take-home message. Level well-targeted at audience. Student is able to adjust to signals from audience that certain parts are not understood.  |
|   | Bad timing (way too short or too long).  | Timing not well kept (at most 30% deviation from planned time).   | Timing not well kept (at most 30% deviation from planned time).   | Timing is OK (at most 10% deviation from planned time).  | Timing is OK.  | Presentation finished well in time.  |
|   | Student is not able to answer questions.   | Student is able to answer only the simplest questions   | Student answers at least half of the questions appropriately.   | Student is able to answer nearly all questions in an appropriate way.  | Student is able to answer all questions in an appropriate way, although not to-the-point in some cases.  | Student is able to give appropriate, clear and to-the-point answers to all questions.  |
| 4. Examination (5%) *                       |  |   |   |  |  |  |
| <b>4.1. Defense of the thesis</b>           | Student is not able to defend/discuss his thesis. He does not master the contents  | The student has difficulty to explain the subject matter of the thesis.   | Student is able to defend his thesis. He mostly masters the contents of what he wrote, but for a limited number of items he is not able to explain what he did, or why. | Student is able to defend his thesis. He masters the contents of what he wrote, but not beyond that. Is not able to place thesis in scientific or practical context. | Student is able to defend his thesis, including indications where the work could have been done better. Student is able to place thesis in either scientific or practical context. | Student is able to freely discuss the contents of the thesis and to place the thesis in the context of current scientific literature and practical contexts.                               |
| <b>4.2. Knowledge of study domain</b>       | Student does not master the most basic knowledge (even below the starting level for the thesis).                                 | The student does not understand all of the subject matter discussed in the thesis.                                | The student understands the subject matter of the thesis on a textbook level.   | The student understands the subject matter of the thesis including the literature used in the thesis.  | Student is well on top of subjects discussed in thesis: not only does he understand but he is also aware of current discussions in the literature related to the thesis topic.     | Student is well on top of subjects discussed in thesis: not only does he understand but he is also aware of discussions in the literature beyond the topic (but related to) of the thesis. |