

Guidelines MSc-Thesis and Internship at AEW

Introduction

Welcome in the exiting world of Aquatic Ecology and Water Quality Management! Here you will find valuable information for a thesis or internship with respect to prerequisites, intake procedure, registration, supervision and facilities, but also on writing and the grading procedure.

Prerequisites

To do a MSc Thesis or Internship, the student must have admittance to a MSc program. Prerequisites for doing a Thesis at AEW depend on the size of the thesis: for a thesis with 24, 27 or 30 credits at least one of the courses from table 1 should be successfully completed and for a thesis with 33, 36 or 39 credits at least two courses. No courses are obligatory for an Internship.

Table 1. Courses that can be followed before a MSc thesis at AEW can be done (for a thesis of 24-30 credits select at least one course, for a thesis of 33-39 credits select at least two).

Code	Title
AEW 20706	Practical Aquatic Ecology and Water Quality
AEW-22806	Marine Systems
AEW-30306	Ecology: Classics & Trends
AEW-30806	Chemical Stress Ecology and Risk Assessment
AEW-31306	Water Quality
AEW-23306	Introduction Marine and Estuarine Ecology

Intake procedure

When you decide to do a thesis or internship at AEW note that it might take time to get everything arranged. Therefore, make sure that you plan your first contact with the chairgroup well ahead (at least a few months before the actual start). Within the chairgroup 3 contact persons are responsible for the intake meetings. Depending on your interest you may contact:

Water Quality	Bart Koelmans (bart.koelmans@wur.nl)
Freshwater Ecology	Edwin Peeters (edwin.peeters@wur.nl)
Marine Ecology	Noël Diepens (noel.diepens@wur.nl)

Appointments for an intake meeting can be made by e-mail. During the intake meeting you will be informed about main research themes at AEW. You can express your interest in one or several possibilities and for the time period that you want to carry out your thesis or internship. In case you decide for a certain topic, an appropriate supervisor will be selected. Thereafter you will mainly deal with your supervisor.

A thesis can be done within the AEW team, but there are also possibilities to perform your thesis elsewhere, however, only after agreement of AEW. The search for a thesis topic outside AEW is the responsibility of the student. Possible host institutes will be evaluated and assessed by the contact person before agreement is given. Internships are always done outside Wageningen University and it is the student's responsibility to find an appropriate institute or organization to perform the internship. In co-operation with the contact person a final decision will be made.

Before you start

Once a topic is chosen and a supervisor selected, the first thing to do is filling in your thesis or internship contract. Click here ([Thesis agreement.doc](#)) for thesis contract and here for internship contract ([Internship contract.doc](#)). In co-operation with your AEW-supervisor you register commitments regarding the thesis/internship work, supervision, evaluation and working plan. Before the thesis agreement is filled in with the AEW-supervisor, the study adviser has to give his consent by signing the contract. This is not needed for the Internship contract (and Learning agreement). The contract should be handed in at the secretariat and a copy must be given to the study adviser.

In case you do your thesis at AEW your supervisor will arrange a working place for you and will introduce you to the members of the AEW-team.

MSc-thesis

General Learning outcomes

In general, WU learning outcomes are categorized in four groups: research competence, thesis report, colloquium, and examination.

More specifically, learning outcomes as formulated by AEW are:

Research skills

1. explore the problem by means of studying relevant literature
2. critically reading literature
3. formulate a theoretical framework
4. delineate the research problem
5. design a research strategy
6. realistically plan all research activities
7. collect empirical research data through experiments, measurements, observations, interviews or literature
8. efficiently analyze (large) data sets also with models and statistics
9. evaluate quantitative results with error propagation
10. relate observations to your own theoretical framework
11. draw conclusions
12. formulate your own opinion on your research
13. evaluate the research from a broader perspective

Communication skills

1. discuss data and results during the course of a thesis
2. discuss problems faced during the thesis
3. be open for suggestions from supervisor(s) and/or other students
4. accept and deal with criticism

Writing skills

1. write a research report or a draft scientific paper
2. structure the report or paper (does the title cover the content, are the different chapters in accordance with their importance, presence of readable summary)
3. meet criteria for correct language use (choices of words, grammar, spelling)
4. take care for scientific verification
5. present tables, figures, maps and/or illustrations in the right way
6. take care of a proper final lay-out of the report or paper

Presenting skills

1. give a structured oral presentation
2. schedule the content of an oral presentation
3. give a presentation within a limited timeframe
4. present readable graphs & tables

General set-up of a thesis

The total period spent on a thesis can be divided into 3 phases: proposal writing, performing the research and thesis writing. Different activities will take place with different products for the phases (Table 2).

Table 2: Different phases in the MSc with activities and products.

Phase	Activity	Product
Proposal writing	Orientation Problem analysis Literature search Work plan Presentation	Written research proposal Start presentation
Performing the research	Experiment, Field work, Modeling Data gathering & data analysis Data interpretation	Data Preliminary results
Thesis writing	Putting the pieces together Writing report Preparation of presentation	Thesis report Final presentation

Proposal writing

Usually you start with a general idea about the thesis and you may have had some discussion with your supervisor. A detailed project plan, however, still needs to be written. This phase lasts in general 4 to 6 weeks depending on the kind of topic, your knowledge etcetera.

You will explore the background of a given research problem, critically review scientific literature, delineate your problem, formulate scientific questions and reflect on methodology. Table 3 shows most elements that should be in a research proposal. Length of proposal is 5 to 8 pages A4. Furthermore, you will present your plan orally for the chairgroup (start presentation: 5 min talk & 5 min discussion).

Table 3. Contents for research proposal

Subject	Content
Project title	As concise as possible formulated
Introduction	Including background of problem, state of the art according scientific literature, scientific & social relevance Formulation of scientific research questions and hypotheses which have to follow logically from the previous parts
Methods	Description of available data, fieldsites & models that will be used, design of field inventory, design of experiments, modelling activities Description of statistical methods to analyze data
Planning	A week to week planning, related to the research activities and research questions

Performing the research

After writing the proposal, the practical work starts (field work, modelling, experiment). Data will be collected and analyzed. During this phase the supervisor will be informed regularly on the progress made. If thesis work is done abroad students have to adapt to working conditions such as institutional hierarchy, ethics, dress code etcetera that are often different from Dutch conditions.

Thesis writing

Usually 4 to 6 weeks are needed to write the final report or paper. In close co-operation with the supervisor the choice for a report or paper will be made. The report has to be written in English or Dutch. When you have a first complete draft of your thesis ready (with all chapters and annexes but some smaller elements may still be missing) ask your supervisor for comments on structure and contents. The supervisor usually needs 1 week for this proof reading. After having discussed the comments with your supervisor, you have at least one chance to improve your draft. Together with your supervisor you make appointments regarding the procedure for proof reading. You have to ask the secretariat from the chair group for a thesis number, that appears on the cover of your thesis. The number of hardcopies will be determined in cooperation with the supervisor. A PDF version of the final report or paper is also required.

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

Therefore, read the Wageningen University plagiarism policy in the Student Charter (2.8 Students and copyright, p. 24-25, and 5.3.3. Fraud and plagiarism, p. 56-47) and Appendices Student Charter (Article 33h, p.117)).

The thesis report has the following contents:

1. Cover page
2. Preface (optional)
3. Abstract (max 1 page)
4. Introduction: problem definition, state-of-the-art, theory/concepts, objectives, research questions
5. Material & Methods: description of how the problem was studied, which materials were used, type of statistical analyses
6. Results: what where the findings?
7. Discussion: Discuss your findings with those from literature, what are good/weaker points in your study
8. Conclusions & Recommendations: answer your research questions and formulate recommendations
9. References & Annexes

Click here ([Example Thesis report.pdf](#)) for an example report.

Final presentation

After the draft thesis is finished, the student has to give a colloquium. Reserve a date with your supervisor in time. Presentations at AEW are scheduled on Thursday mornings and reservations can be made at the secretariat. Twenty minutes are reserved for the oral presentation followed by 10 minutes discussion. It is strongly advised to have a test colloquium a few days before.

Final meeting

In a final meeting, your supervisor will question and discuss your thesis, its relevance, and your opinion about your own work. During this meeting the mark will be given.

Assessment

The standard form Thesis evaluation Wageningen University (click here ([Thesis assessment form.xls](#)) for downloading) will be used. The standard rubric for the assessment will be applied by your supervisor (click here ([Thesis Rubric.pdf](#)) for downloading).

MSc-Internship

The internship provides you the opportunity to work outside Wageningen University at a host organisation, e.g. a company, public institution, consultancy firm, research organisation, another university or non-governmental organisation, thereby broadening your academic horizon. The host organisation/work should be of sufficiently high academic standard to reflect the desired level of Wageningen graduates.

Learning aims

General aims for an AEW Internship are:

1. apply knowledge and skills acquired during the course of your study
2. execute certain professional skills better
3. work in a professional environment

As learning outcomes can be mentioned (depending on the type of internship and topic)

1. explore the workfield of the organization
2. apply specific knowledge in practice
3. work in a team
4. set up a working plan with time schedule
5. efficiently use and analyze information
6. judge your own work
7. be open for criticism
8. accept and use comments
9. write an internship report
10. structure the report logically

Next to the above mentioned learning outcomes you should formulate your own, more specific personal outcomes.

General set-up of an internship

The total period spent on an internship can be divided into 3 phases: proposal writing, working phase and writing phase. Different activities will take place with different products for the phases (Table 4).

Table 4: Different phases in the MSc with activities and products.

Phase	Activity	Product
Proposal writing	Orientation Problem analysis Literature search Work plan Presentation (optional)	Written research proposal Start presentation (optional)
Working phase	Experiment, Field work, Modeling Data gathering & data analysis Data interpretation	Data Preliminary results
Report writing	Putting the pieces together Writing report Preparation of presentation (optional)	Internship report Final presentation (optional)

Proposal writing

Usually you start with a general idea about the internship and you may have had some discussion with your supervisor of the host institute and the one from AEW. A detailed project plan, however, still needs to be written. This phase lasts in general 4 to 6 weeks depending on the kind of topic, your knowledge etcetera.

You will explore the background of the problem, critically review scientific literature, delineate your problem, formulate questions and reflect on methodology. Table 5 shows most elements that should be in a research proposal. Length of proposal is 5 to 8 pages A4.

Table 5. Contents for research proposal

Subject	Content
Project title	As concise as possible formulated
Introduction	Including background of problem, state of the art according scientific literature, scientific & social relevance Formulation of the research questions and hypotheses which have to follow logically from the previous parts
Methods	Description of available data, fieldsites & models that will be used, design of field inventory, design of experiments, modelling activities Description of statistical methods to analyze data
Planning	A week to week planning, related to the research activities and research questions

Performing the research

After writing the proposal, the practical work starts (field work, modelling, experiment). Data will be collected and analyzed. During this phase the AEW supervisor will be informed regularly on the progress made. If internship work is done abroad students have to adapt to working conditions that are often different from Dutch conditions, such as institutional hierarchy, ethics, dress code etcetera.

Internship writing

Usually 4 to 6 weeks are needed to write the final report. In close cooperation with the supervisors a choice for a report or paper will be made. Common languages are English and Dutch. When you have a first complete draft of your internship report ready (with all chapters and annexes but some smaller elements may still be missing) ask your AEW supervisor for comments on changes in structure and contents. Reflection report is an obligatory part of the internship report and can be added as an annex. The AEW supervisor usually needs 1 week for this proof reading. After having discussed the comments with your AEW supervisor, you have one chance to improve your draft. Ask the secretariat of AEW for an Internship Report number, that should appear on the cover of the report. The number of hardcopies will be determined in cooperation with the AEW supervisor. A PDF version of the final report or paper is also required.

The task of writing a thesis sometimes lures students into using other's work, ideas, facts, texts etcetera and presenting it as their own. It is important to understand that plagiarism is considered as a very serious offence against academic norms and, hence subject to equally serious punishment. Therefore, read the Wageningen University plagiarism policy in the Student Charter (2.8 Students and copyright, p. 24-25, and 5.3.3. Fraud and plagiarism, p. 56-47) and Appendices Student Charter (Article 33h, p.117)).

The internship report has the following contents:

1. Cover page
2. Preface (optional)
3. Abstract (max 1 page)
4. Introduction: problem definition, state-of-the-art, theory/concepts, objectives, research questions
5. Material & Methods: description of how the problem was studied, which materials were used, type of statistical analyses
6. Results: what where the findings?
7. Discussion: Discuss your findings with those from literature, what are good/weaker points in your study
8. Conclusions & Recommendations: answer your research questions and formulate recommendations
9. References & Annexes, including the reflection report on internship also in relation to your study program

Click here for an example report ([Example Internship report.pdf](#)).

Final presentation (optional)

After the draft internship report is finished, the student is free to give a colloquium. If so, reserve a date with your AEW supervisor in time. Presentations at AEW are scheduled on Thursday mornings and reservations can be made at the secretariat. Twenty minutes are reserved for the oral presentation followed by 10 minutes discussion. It is strongly advised to have a test colloquium a few days before.

Final meeting

In a final meeting, your AEW supervisor will question and discuss your work during the internship. During this meeting the mark will be given.

Assessment

The standard form Internship evaluation Wageningen University (click here ([Internship assessment.xls](#)) for downloading) will be used. The standard rubric for the assessment will be applied by your AEW supervisor (click here ([Internship Rubric.pdf](#)) for downloading). Usually the host supervisor is also asked to fill in the evaluation form.