

HWM thesis and internship rules

Hydrology and Quantitative Water Management Group

www.hwm.wur.nl

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1 Theses and internships

The MSc programmes Earth and Environment (MEE) and Climate Studies (MCL) include a specialisation *Hydrology and Water Resources* or *The Physical Climate System*. In both programmes this specialisation includes a compulsory thesis of 6 months (36 credits) and internship of 4 months (24 credits). The main difference between the thesis and internship is that for a thesis you ask and answer a research question at academic level, while for an internship you complete an assignment at academic level.

The aim of this document is to clarify the rules and regulations and show some possibilities you have as a student to personalise your MSc programme. Since the regulations may change somewhat over the years, the most recent version on the day you start your thesis or internship counts. The most recent version of this document and other information can be found via www.hwm.wur.nl → education → MSc theses or Internships and on the HWM thesis Brightspace, where all thesis and internship related information is collected.

1.1 Thesis

The MSc thesis is the most important part of the study programme. You develop research skills and become an expert on a topic of your choice. By designing a project, collecting and analysing data, communicating your findings through a written thesis and colloquium, and a critical reflection on your own research, you complete a full research circle. This is your chance to show what you have learnt at the university and you can use your thesis as proof of your quality.

1.2 Internship

The academic internship gives the student a unique opportunity to experience how it is to work at a consultancy firm, water board, government agency, research institute, or foreign university and will help to find a job after graduation. You will work on one concrete assignment and become familiar with the background of the company/organization, the market and customers, research aims or public tasks and of course the employees of the internship provider. However, the internship is part of the curriculum, and therefore the academic level is important and the final report is an important outcome.

2 Choices

2.1 Planning

Most students use their last year for their thesis and internship, but theses and internships is relatively flexible. These courses don't have to fit in the 6-period academic calendar and you can work during the holidays or go on vacation when the rest of the university is working (as long as you specify it in your thesis/internship agreement – see Sec. 3.7). Do realise that supervisors may not be available the whole summer, so plan well in advance.

Plan your thesis/internship well in advance, especially when you depend on people from outside the university (abroad or internship provider).

2.2 Thesis or internship first?

You can choose in which order you want to do your thesis and internship. A reason for doing an internship last could be that you hope to find a job there after graduating. A reason for doing a thesis last could be that it is the most important part of your curriculum and you want to be as well prepared for this final assessment as possible.

2.3 Courses

Following courses at the university is very cheap compared to following courses after you graduate (3000 euros for a week is no exception). Therefore, you may want to use the opportunity while you are still a student and follow additional courses to strengthen your profile.

You can follow courses during your thesis project (apart from a few compulsory courses, which you should have passed before starting your thesis/internship – Sec. 3.1). For example, you can follow Hydrogeology in period 1 and work on your thesis only in the afternoons, or you can do your ACT-project part-time when you've already started on your thesis project.

If you want to follow extra courses, but don't want to delay your graduation, you can choose to work on your thesis/internship in the summer months (be aware of the limited availability of supervisors).

2.4 Deciding what you want

Before you start looking for specific topics, you should think about what you want to learn during your thesis/internship. In every thesis and internship project you will improve your research skills and skills in project management, reading,

Table 1: Summary of thesis and internship specifications. Contact Tamara Schalkx for administrative issues.

	Thesis	Internship
Code	HWM-80436 (80418–80439)	HWM-70424 (70424–70439)
Credits	24–39 (typically 36*)	18–39 (typically 24*)
Duration	4–6.5 months (typically 6*)	3–6.5 months (typically 4*)
Coordinator	Roel Dijkma	Victor Bense
Supervisors	2 from HWM	1 from HWM + 1 from internship provider
Topic	Linked to HWM research	Linked to field of internship provider
Evaluation	30% research competence	30% professional skills
	50% report	40% report
	10% colloquium	10% colloquium
	10% examination	10% examination
		10% self-reflection note

* depending on study programme

writing and presenting, but there are differences in focus between research projects.

- Do you want to focus on improving data processing, modelling or field work skills?
- Do you want to dive into the scientific literature or do you want a project with a direct link to practical application?
- Do you want to specialize and do your thesis and internship on a similar topic or do you want to widen your horizon and choose very different topics.
- Do you want experience abroad?

2.5 Finding a topic

The thesis/internship topic must fit within the specialisation of HWM and have a close relation with the MSc courses of HWM. For MCL students, the topic should also fit within the theme of that programme, so you should be able to explain how your thesis topic relates to Climate Studies. Theses and internships can only be done individually. Sometimes, parts of the thesis research project (e.g. field work) can be combined with the thesis work of another student. There are several ways to find a suitable topic.

- Look at the announcements of past theses and internships on tip.wur.nl.
- Talk to staff members when you follow their courses.
- Talk to current thesis and internship students.
- Visit the annual thesis market in February where HWM staff will present current topics.
- Find out what research HWM staff members are involved in. Just typing their names in Google (Scholar) already gives a good overview.
- Look at the thesis and internship reports in the HWM library (bookcase next to our big table) or on library.wur.nl/WebQuery/theses (hydrology theses will be added soon).
- Attend other students' thesis and internship colloquia to get an idea of what they did.

- Look in the Pyrus news letter.
- Talk to the thesis/internship coordinator. He can give an overview of possibilities and direct you to other staff members. Please don't make appointments with more than two staff members yourself (unprepared "shopping" is time consuming).

2.6 Second thesis

Second theses could be a nice addition to your programme, if you don't mind delaying your graduation with a few months. Second theses are especially useful when you want to specialize in several topics or when you want to achieve different learning objectives (e.g. both field work experience abroad and an in-depth research topic). Students with (supervised) work experience on an academic level may exchange the internship for a second thesis (ask your study advisor).

2.7 Going abroad

2.7.1 Thesis abroad

Because it is such an important part of your study programme, it is very important that the academic level of theses is guaranteed. There are several possibilities for doing (part of) a thesis abroad.

- You are supervised by an HWM staff member, start and finish your thesis at HWM, but go abroad for a few months in between for instance for field work, often related to ongoing research projects.
- You are supervised by an HWM staff member and a researcher from a university abroad with whom the staff member has close contact and can guarantee appropriate supervision and facilities during your stay abroad.

MSc theses should always be connected to current HWM research projects. Staff members decide if a topic meets this requirement. It is your responsibility to make sure that

you make the best use of the scientific expertise available among the staff members of the chair group HWM.

2.7.2 Internship abroad

For internships, the academic requirements are less strict, because one of the learning objectives for internships is to get acquainted with other working environments. There are several possibilities for doing an internship abroad.

- The internship provider is a Dutch company that has an office or project abroad.
- The internship provider is a foreign company or NGO.
- The internship provider is a foreign university or research institute.

Of course you should also have an HWM supervisor (just like internships in the Netherlands; Sec. 3.5).

2.8 FAQ

- *Is it possible to involve another chair group?*
Yes. This happens quite often. You need supervisors from both groups. In the thesis agreement, you should specify the percentages of contribution from the groups. You should also agree upon the thesis evaluation criteria (Table 1), because the percentages may differ between groups.
- *Is it possible to extend the thesis/internship?*
Yes (see Sec. 3.1). Ask your study advisor for advice and approval.
- *I don't like travelling. Can I do my internship in Wageningen?*
Yes. There are a few companies and of course Wageningen Environmental Research. It is also possible to do an internship at the Laboratory for Water and Sediment Dynamics, but we recommend spending time outside the university.
- *Can I do my thesis at an institute, government agency or company?*
Yes, in exceptional cases, but only if we have very good contact with your supervisors, such that the academic level of your thesis is guaranteed.

3 Rules and regulations

There are quite some rules for theses and internships. Some are set by the university and exam committee, others by HWM. This section gives an overview of the HWM rules.

3.1 Requirements

Before you are allowed to start your thesis/internship, a significant part of the MSc courses should be completed, including passing several courses. You should have passed two courses in the following set: *Catchment and Climate Hydrology* (HWM-32806), *River Flow and Morphology* (HWM-30306), *Advanced Hydrological Systems Anal-*

ysis (SLM-33306), *Water and Air Flow Numerical Techniques* (HWM-33806), *Coastal Oceanography and Delta Geology* (HWM-33306), *Urban Hydrometeorology* (MAQ-35306), *Hydrogeology* (HWM-20806) or *Geophysical Fluid Mechanics* (HWM-23806) and at least one of these courses should be in the set: *Catchment and Climate Hydrology* (HWM-32806), *River Flow and Morphology* (HWM-30306) or *Advanced Hydrological Systems Analysis* (SLM-33306).

A less extensive study programme may result in a restricted choice of topics. For example, if you haven't followed *River Flow and Morphology*, you are allowed to do a thesis at HWM, but discouraged to choose a topic which requires knowledge from that course.

Your study advisor (MEE: Alet Leemans, MCL: Rudi Roijackers) has to approve that you are allowed to start. Email her/him and send the response to your supervisor(s).

3.2 Size

The standard number of credits for a thesis is 36 credits (6 months) and for an internship 24 credits (4 months). If you want to extend the duration of your thesis (max. 39 credits = 6.5 months), you must consult your study advisor first. Thesis topics with a size of 18 – 33 credits can be used as minor or 2nd thesis (ask study advisor and exam committee for approval).

3.3 Academic level (internship only)

At Wageningen University, the internship has an academic level, because it is part of the curriculum. This means that at your internship provider, you have to be supervised by a specialist with academic background. The academic level of the internship will be estimated at the start, based on a project description (see Sec. 3.8.2), and evaluated afterwards, based on the final report. The report is the most important part of the evaluation (see Table 1). Showing that you can evaluate your results critically (and not just carrying out what the internship provider tells you to do) is an important part of the internship.

Typical activities for an internship are: modelling, data collection and analysis or data processing and interpretation. The internship provider sets a concrete project in close consultation with the HWM-staff and the student (written down in the project description; Sec. 3.8.2), and the student can start from the beginning.

3.4 Provider (internship only)

Finding an internship provider is your own responsibility, but the HWM-staff is always willing to help and can use its (inter)national network if necessary. Sometimes companies or institutes have open positions for an internship student, and inform the chair group about it. Internship possibilities are posted on a regular basis on the HWM internship information board in Lumen and in the Pyrus

newsletter. The following list contains possible locations for an internship:

- Engineering and consulting firms (see www.nwp.nl for water related firms and institutes)
- Water boards (www.waterschappen.nl)
- Provinces and municipalities
- Government and research institutes (Rijkswaterstaat, KNMI, RIVM, Wageningen Environmental Research, Deltares, KWR, NIOZ)
- Foreign universities and research institutes
- External contacts of the HWM-staff (domestic and foreign)

You can also look at the list of previous internships that are provided on the HWM website for inspiration or ask the internship coordinator for a list of contacts.

3.5 Coordinator, supervisors and examiner

The thesis/internship coordinator (see Table 1) can give you information on possible topics, internship providers and supervisors. Tamara Schalkx is the HWM secretary and can be contacted for administrative issues.

HWM thesis students have in principle two university supervisors, with a HWM staff member as first supervisor. External supervisors can be added to the team. Thesis students are officially entitled to two hours of supervision per week during 6 months (combined effort of all supervisors). In practice, HWM supervisors spend more time on supervising than required, especially when supervisors read and comment the proposal and report.

HWM internship students have one supervisor at the internship provider and one from HWM (Table 1). The HWM supervisor should be a permanent staff member, i.e. Victor Bense, Claudia Brauer, Roel Dijkema, Tim van Emmerik, Ton Hoitink, Lieke Melsen, Martine van der Ploeg, Ryan Teuling, Bart Vermeulen or Albrecht Weerts.

For both theses and internships, you also need an examiner. The examiner is not involved in the project but checks the level of the products (proposal / internship plan + thesis / report) and grading and is present at the examination (Sec. 3.15). The examiner should be a permanent staff member (i.e. Victor Bense, Claudia Brauer, Roel Dijkema, Tim van Emmerik, Ton Hoitink, Lieke Melsen, Martine van der Ploeg, Ryan Teuling, Bart Vermeulen or Albrecht Weerts). Who the examiner will be, is determined at the start of the project.

Note that just like between students, there are differences between supervisors in their way of working. Some supervisors prefer to have two-weekly updating emails and regular meetings, while others prefer a more loose contact. Some supervisors prefer to read the whole draft report at once, while others prefer to read it in parts (so they can comment directly and students can apply the new knowledge directly when writing the next chapters). In other words, discuss what you can expect from each other during

the first meeting and write it down in the thesis agreement, so you won't be surprised or disappointed.

3.6 Workplace

~~For thesis students, HWM can provide desks and computers in the HWM student room (Lumen E101). Desks are arranged through the supervisors and the secretary. If you apply for a desk, you are expected to spend a considerable amount of time there (or the desk will be assigned to someone else). Internship students work at their internship providers, but are welcome to spend some time (e.g. one day a week) at the chair group (no desk will be reserved for that purpose).~~ In the fall of 2020, the number of desks will be limited. Since the regulations change often, we will keep you informed about the possibilities for working in Lumen via email.

3.7 Agreement

All concerned parties must sign the thesis/internship agreement (forms on HWM website or Brightspace). For internships, this should be completed before you start; for theses at least within the first two weeks (or before you go abroad). When the agreement is signed by yourself, your supervisors and the examiner, give it to the secretary. She will make sure that the document is scanned. The internship project proposal (Sec. 3.8.2) is added as annex to the internship agreement. This agreement concerns your education, so agreements with your internship provider about e.g. financial compensation are not part of it.

This agreement is important for you, especially in the case of internships. When all parties have signed it, your supervisors have committed to your project and promised to guide you through it, and in turn you have promised to work on this project and finish within a certain period (see Sec. 3.9 on what to do in case of delay). The signed agreement gives you proof of the intended project and planning, which you can use in case of conflicts.

In the agreement, you already set the date of your thesis/internship colloquium (Sec. 3.13) and proposal presentation (for theses; Sec. 3.10). Check these dates with the secretary Tamara Schalkx and ask her to send the meeting requests. Check in the Google sheet (link on Brightspace) if your agreement has been received and that the information has been entered in the sheet.

3.8 Proposal

3.8.1 Thesis

The thesis work starts with writing a research proposal. Important aspects of this proposal are the research objective, research question, methods and time schedule. Preferably, in order to avoid that too much time is spent on the proposal, the first drafting of the proposal starts prior to the real start of the thesis work. You can use the LaTeX thesis proposal template, which includes the main chapters (see

HWM thesis and internship tips), but you are not obliged to use it. The proposal should not exceed 3 pages (excluding time table and references). Upload the final version of the thesis proposal to Brightspace. Also see Brightspace for some examples.

3.8.2 Internship

Instead of a full proposal, internship students write a 1-page project description with subject delineation and time schedule prior to starting the internship. This project description is added as Annex to the internship agreement.

3.9 Delay

In the thesis/internship agreement, the date of completion is set (see also Appendix B). If you need an extension, you must write an email (4 weeks before the deadline) to the examiner, indicating the reason(s) for the delay and an adapted planning. Explain what you will do in order to meet the new deadline, for example change the way you work, communicate differently with supervisors or alter the topic.

3.10 Proposal presentation (thesis only)

Every thesis student will give a short lunch presentation after about 1 month work. You present your research proposal in 7 minutes, followed by 8 minutes of discussion. Proposal presentations are in English and take place in room E112 the Virtual Classroom on Brightspace on Wednesdays or Fridays during lunch. ~~You should arrange a laptop and set up the beamer yourself before the presentation starts and put the beamer back after the presentation(s). If there are other presentations before and/or after yours, arrange with the other speakers beforehand who will set up and who will put away the beamer and laptop.~~

The objective of this presentation is to show fellow students and staff what you are working on, which is both fun (it's nice to know what people next door are doing) and useful. You may get relevant feedback from people who are not involved in your project, which you can use during your project, or you can learn that other people are working on a similar topic and team up.

It helps you to get your research objective and plan very clear (7 minutes is not much). After the presentation, the audience should understand why your project is so important, what your objectives are and how you're going to achieve your goals (and answer your research questions).

3.11 Report

At the end of the thesis/internship you hand in a report. The report is a final version and will be evaluated by the university supervisor(s). The report has the structure of a research report and should be in English. If you want to write in Dutch, you have to

request permission from the examining board (examiningboard.environmentandlandscape@wur.nl). The report should have fewer than 40 pages (excl. appendices, min. font size of 10) and the maximum size is 8 MB (for the pdf), to allow easy storage and distribution (this is also the maximum for PhD theses in Wageningen). See the additional document *HWM thesis and internship tips* for tips on report set-up, text, figures and technicalities. We recommend LaTeX as an efficient text editor, but you are not obliged to use it.

If your thesis or internship report is very good, you may think of trying to publish it in a scientific journal. If you discuss this with your supervisors in an early stage, you can write your thesis report in the form of a scientific paper.

3.12 Self-reflection note (internship only)

The student is requested to write a "self-reflection note" (max. 2 pages, structured like any report with a clear introduction, main text and conclusions). In the reflection note the student evaluates his/her own performance and write about the future. The personal reflection report should describe your personal development during the internship and your goals for further development. Questions on the learning outcomes you have to answer are for example:

- What were the most important learning outcomes?
- What activities did you perform to attain these learning outcomes?
- How do you evaluate your performance on these activities?
- What are your feelings on your performance on these activities?
- Could you have done things in another way? And, if so, how?
- What did you experience as your strong and weak points in this working environment?
- How can you improve your weak points?
- What gaps do you identify in your knowledge and skills in your professional development?
- What was the contribution of results to the goals of the organization/the larger project the internship was a part of?
- Based on your experience gained during this internship, which working environment (commercial, academy/research or public domain) is most suitable for you and why?
- What are your plans for the near future?

Send the self-reflection note at least one week before the colloquium to the internship coordinator, Victor Bense. He will evaluate it on the basis of evaluation criteria of a good reflection report (see for example ACT or the thesis Brightspace).

3.13 Colloquium

The date of the colloquium is already fixed in the agreement. When planning that day, you take into account the availability of the university supervisor(s), the examiner and external supervisors (if applicable). Please check in the Google sheet if the presentations are indeed scheduled to avoid last-minute requests and disappointments if your preferred time slot is no longer available.

You are in charge of your planning, so don't wait for your supervisors to mention the colloquium, but raise the topic yourself. Ask your supervisors if they think the quality of your work is high enough to present within the planned time frame; if not, apply for extension (Sec. 3.9).

You can update the title (the title of your proposal is the default) up to three weeks before the presentation by emailing Tamara Schalkx. She will then make a first announcement for staff, HWM students and the Pyrus newsletter. At least two weeks before the presentation, send an abstract (which has been approved by the supervisors) to Tamara Schalkx. She will make an announcement of your abstract and email it around to a larger audience as well as put it on the HWM website.

Your report should be finished before the colloquium. Send the final version to your supervisors and upload it to Brightspace. Also upload your presentation to Brightspace.

Thesis colloquia consist of a 20 min. presentation and 10 minutes discussion; internship presentations are 15 min. presentation and 5 min. discussion. The first questions from the audience are reserved for fellow students. It is in English and takes place in ~~Lumen E112~~ the Virtual Classroom on Brightspace. Colloquia are scheduled on Wednesdays and Fridays during lunch. See the Google sheet (link on Brightspace) for the scheduled presentations. ~~You should arrange a laptop and set up the beamer yourself before the presentation starts and put the beamer back after the presentation(s). If there are other presentations before and/or after yours, arrange with the other speakers beforehand who will set up and who will put away the beamer and laptop.~~

You are welcome to invite friends and family to your colloquium (it's one of the few opportunities to show them what you've been doing), but target the level of your presentation to fellow students and HWM staff members that were not involved in your project.

3.14 Colloquium attendance

Students and staff are expected to attend as many colloquia as possible. It is a matter of courtesy to listen to your colleagues present what they have been working on for months.

As a (very) minimal effort, every thesis student has to attend 3 colloquia (thesis or internship) from fellow students. Appendix A contains more information ~~and a form on which you should collect signatures to prove you attended these three colloquia.~~

3.15 Examination and final discussion

After the colloquium, the audience leaves the room and a discussion of about 20 minutes will follow. This discussion has the set-up of an oral exam, in which you should prove to the supervisors and the examiner that you understand what you did, what the effect is of your choices, what the contribution of your research to science and practice and how your research fits in a broader context. This exam determines part of the final grade (see Table 1).

3.16 Evaluation

After the discussion, you leave the room and the thesis/internship will be evaluated according to the official assessment forms (see HWM website; for weights of evaluation criteria, see Table 1), using the official thesis and internship rubrics (downloadable from the HWM website).

Internship students should ask the internship provider to send their evaluation of the professional skills (category A on the assessment form) to the university supervisor before the final presentation. The university supervisors then make sure that all items are evaluated. Finally, you are informed about the assessment. In exceptional cases, you can be asked to improve the report based on the colloquium and discussion. The supervisors check whether the changes have been made.

3.17 Report distribution

Upload the final report to Brightspace at least two days before the colloquium. Send a digital version to your supervisors, the examiner and the secretary. You do not have to print hard copy versions of the report yourself. Tamara Schalkx will print and put one copy in the "HWM library" (the book case in E112), for other students to use as reference and to show prospective thesis and internship students what possibilities there are (during thesis markets or open days). If you want a copy for yourself, you have to print it yourself.

3.18 Data (thesis only)

The student is required to give the main supervisor all thesis material: data, scripts, figures, report in pdf and tex (including figures) or doc and presentation in tex/ppt and pdf. Add readme-files to help potential users understand your logic (see *HWM thesis and internship tips*). This material can be used in future (thesis) projects (of course with the appropriate references). The data can be sent through SurfFileSender or with a USB stick.

3.19 Completion

The supervisor sends the signed assessment form to Tamara Schalkx after receiving

- pdf (max. 8 MB) of the report
- data and other material (for thesis)

Tamara will enter the grade in the student administration system after receiving (digitally from the student):

- signed thesis/internship agreement
- signed thesis/internship assessment form

and checking if these are on Brightspace:

- thesis proposal (thesis only)
- report (max. 8 MB)
- presentation
- colloquium attendance form (thesis only)

A Form for attendance thesis/internship colloquia HWM

At the university many colloquia take place as part of MSc theses, internships or scientific symposia. Attending colloquia helps you to prepare for your own colloquium, to get ideas for your thesis research and to put the thesis research at HWM into a broader scientific and societal context. Therefore, we advise you to attend as many colloquia as possible. Feel free to take notes and partake in the discussion. Do not be afraid to ask questions after the colloquium — we value your contribution and will not use “bad questions” against you when assessing your own thesis.

Because we find it important that you attend colloquia, you are obliged to attend at least three thesis or internship colloquia before you complete your MSc thesis Hydrology and Quantitative Water Management (HWM-80436 or HWM-80439).

What you should do:

- Visit at least three thesis colloquia or internship presentations of the Hydrology and Quantitative Water Management Group.
- ~~Write down the name of the student giving the colloquium, the title and date in the table below.~~
- ~~Ask one of the student's supervisors for a signature to prove that you attended the colloquium. You have to obtain the signature directly after the colloquium.~~
- ~~When you have collected three signatures, scan this paper and upload it to Brightspace. Keep this paper for your own administration.~~
- Continue attending colloquia (you are not obliged to, but advised to).

Name: _____

Registration number: _____

Signature: _____

Date	Name student	Title thesis/internship	Name supervisor	Signature supervisor

B Planning checklist

When	What	Thesis	Internship
6–2 months before start	Contact Roel Dijkma (thesis) or Victor Bense (internship)		
6–1 months before start	Find topic and supervisors		
1 month before start	Contact Tamara Schalkx to be added to mailing list and Brightspace		
1 month before start	Contact Tamara Schalkx to request work space		x
2–1 weeks before start	Write 1-page project proposal	x	
2–1 weeks before start	Complete and sign thesis/internship agreement, give to Tamara Schalkx		
Week 1	Schedule thesis proposal presentation with Tamara Schalkx		x
Week 1	Schedule colloquium with Tamara Schalkx		
	Check progress of administrative arrangements on Google Sheets		
	Attend 3 colloquia, complete appendix A, scan, upload to Brightspace		x
Week 3–5	Upload thesis proposal to Brightspace		x
Week 4–5	Present thesis proposal		x
3 weeks before end	Send abstract and title (if different from proposal) to Tamara Schalkx		
1 week before end	Send reflection note to Victor Bense	x	
1 week before end	Ask external internship supervisor to send evaluation (part A on assessment form) to internship supervisor	x	
2 days before end	Send pdf of report to supervisors and examiner and upload to Brightspace		
2 days before end	Send data and scripts to supervisors		x
1 day before end	Upload presentation to Brightspace		
End	Give colloquium and do examination		