

Internship Course Guide

Meteorology and Air Quality Group

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1 Introduction

This internship guide describes the procedures for the internship supervision, assessment and report writing process at the chair group Meteorology and Air Quality of Wageningen University. The aim of the academic internship is to experience the institutional, entrepreneurial, and labour reality of a possible first academic working environment as a recent graduate from your study programme. 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 or another university or nongovernmental 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.

This internship guide is meant for staff and students. It includes information about the goal of the internship, the role of the internship contract, the admission requirements, the responsibilities of supervisors and students, the assessment procedure, plagiarism and the submission requirements of the final report. The appendices contain a number of useful documents.

2 Meteorology and Air Quality

Research in the department is divided into three separate (although not mutually excluding) fields, each with its own professor. It is important to know in which of these three fields your thesis research will be, as it determines who the examiner and supervisor(s) will be.

2.1 Meteorology (prof. AAM Holtslag, MAQ-70824/39)

The focus is on the study of atmospheric systems and physical processes on the mesoscale (including the boundary layer) and at the interface between the atmosphere and the land surface. To fully describe the three-dimensional state of the atmosphere and its evolution in time, numerical models are indispensable. These usually require large amounts of data and knowledge of data acquisition is therefore essential. Validation of models is done by using or performing measurements. Measurements are also crucial in the development of new and advanced measurement techniques.

Physics of atmospheric systems and processes as well as computer skills and advanced statistics are key elements in this field. Students are trained in collecting and processing meteorological information efficiently with a view to the projection of future conditions of the atmosphere.

Focus on the mesoscale and boundary layer

The Atmospheric Boundary Layer (ABL) is the layer above the Earth's surface. It is the atmospheric layer that relates the surface processes with the meteorological phenomena that occur at the meso- and synoptic scales. The turbulent nature of the ABL is one of the most challenging problems in geophysical flows. The turbulent characteristics of the ABL depend on the wind shear (both day and night) and either the thermal convection, as normally occurs during daytime conditions, or stable stratification, as normally happens during nocturnal conditions.

Focus on the small scale

On the smallest scale we study the physics of the environment near the land surface - atmosphere interface. Since most land surfaces are vegetated this includes the 'physics' of living organisms. In particular the exchange of heat, mass (water vapour, CO₂, NH₄ etc.) and momentum over land surfaces are studied. Attention is paid to both the way land surface processes can be described in weather forecasting and climate models as well as to observational methods, which are required to verify these descriptions.

2.2 Atmospheric Chemistry and Air Quality (prof MC Krol, MAQ 71324/39)

Study of the physical-chemical processes, the composition of the atmosphere and the exchange between atmosphere and surface. The scale at which these processes are studied extends from local scale to global scale. Lectures cover a wide range of subjects like: processes (emission, dispersion, chemistry, deposition), measuring (gasses and aerosols by *in situ* instruments or satellites) and topics

related to effects (ozone hole, greenhouse gasses, aerosols, effects on health. The processes dispersion, deposition, atmospheric chemistry and global warming are strongly related boundary-layer meteorology and micrometeorology. Numerical modelling of atmospheric chemistry and air quality provide a broad range of subjects that are highly relevant for densely populated countries like the Netherlands, and urban areas all over the world. This includes global modelling on large scales, Gaussian modelling on local up to national scale and the analysis of trace gases and their interaction with the Earth's surface (emission, deposition).

Focus on the role of air quality in effects, and on humans and ecosystems

Effects of air quality on mankind were already documented in the middle ages but extended to more than local problems because of growth of the population and intensive use of coal in the 19th century. Increased death rate caused by winter smog was the result. The 20th century offered a sharp increase in problems and scale of the problems: summer smog, acidification of ecosystems, enrichment with nitrogen, persistent organic matter and heavy metals. A little later the greenhouse effect and the ozone hole were added to the problems. Global warming and nitrogen are still issues, supplemented by violation of EU standards for fine dust and NO_x, to a large extent emitted by traffic. Improvement of local air quality by reduction of emissions and use of vegetation to enhance deposition and dispersion are recent subjects for students to work on.

Focus on modelling and monitoring of air quality

Models for calculation of dispersion, chemical conversion and deposition are widely used for environmental policy, inventory of air quality, scenario analysis and for obtaining better insight in processes like deposition, aerosol and ozone formation etc. taking place in the atmosphere. Models range from local scale to calculate nuisance from odorous compounds, ammonia deposition and air quality along highways, to meso-scale models to calculate boundary layer processes. Mesoscale models are used to study transport in complex terrain. Finally global scale models are used for budget calculations for greenhouse gasses and transport of aerosols. Validation of models is important in assessing accuracy of model prediction or stimulation of knowledge on atmospheric processes. On local scale this is done by comparison with surface measurements, on larger scale also with measurements from satellites.

2.3 Climate Dynamics (prof W Hazeleger, MAQ-70824/39)

The focus is on the atmospheric processes on a global scale and their links to the climate system. Profound knowledge of the climate from a system's perspective serves as a basis for studying changes in the climate. Although the climate never has been static, it is now influenced by human activities in an unprecedented way, mainly as a result of an enormous increase in fossil fuel combustion. Attention is paid to the modelling of climate and climate variability.

Focus on the large scale

In forecasting day-to-day weather and in climate research large-scale systems and processes play an important role. In operational meteorology we try to forecast the future state of the atmosphere and its implications for the weather. In the temperate latitudes the weather is mainly determined by the presence and evolution of synoptic systems such as depressions (including their frontal systems) and areas of high-pressure (anticyclones). The study of the structure of these systems is called synoptic meteorology, while the study of their evolution is called dynamical meteorology. It is obvious that courses dealing with these subjects are the cornerstone for subjects having this focus. In addition to the theory the practical application of the theoretical concepts in day-to-day weather situations is needed.

In climate research the aim is to understand and predict the behaviour of the climate domains (atmosphere, hydrosphere, biosphere, lithosphere and cryosphere) on a broad range of time and length scales. To this end we need to know (changes of) the external forcings and the various feedback processes. Apart from measurements climate research is devoted to either numerical modelling and/or statistical analysis of model or measurement data. In both cases the usually

large amount of data necessitates the use of elaborate statistical methods and visualisation techniques.

Focus on data analysis

Many of today's climate change phenomena have been discovered by carefully analysing climate data gathered using direct methods (instruments) or indirect methods (historic records, tree rings, fossil records). Data analysis still is one of the cornerstones of present-day climate research. In order to discover climate variability and trends, long series of high quality measurements are necessary. A major effort of the scientific community is in gathering and distributing these data. The next step is the analysis of these data using statistical methods. As more data become available, e.g. through satellites and reanalysis projects, it is possible to study ever more components of Earth's climate.

Focus on climate modelling

Data analysis may provide the first clue to climate variability and change. However, our understanding of why and how climate is changing depends largely on studying the processes which govern the climate system. An indispensable tool for this is using numerical climate models. Through modelling we are able to isolate and study physical, chemical and/or biological processes which are part of the climate system.

3 Aims and components of an internship

After completion of the internship you are at least expected to:

- be able to apply knowledge and skills acquired during the course of study;
- be able to execute certain professional skills better
- be able to work independently and with a feeling for the organisation;
- have expanded your professional network.

Next to the above mentioned learning outcomes you should formulate your own more specific, personal learning outcomes and discuss these with your supervisors. You discuss how you can exercise and get feedback on your specific, personal learning outcomes. These specific, personal learning outcomes are part of the Wageningen University Contract and Learning Agreement for internships (see Appendix A).

The internship may include:

- drawing up of a work plan
- formulation of a research question or hypothesis
- gaining specific knowledge which you need for the internship (literature study)
- performing an experimental study (laboratory, field work and/or computer modelling)
- arrangement, analysis and interpretation of the results
- drawing conclusions
- writing an internship report
- oral presentation of your results (colloquium).

Not all these activities will have the same weight in all cases.

4 Getting started

4.1 Prerequisites for an internship

It is customary to do the internship after doing the MSc thesis. In that way you will have become accustomed to working on a specific project for a matter of many weeks at a time. And also specific

academic skills such as doing independent (though supervised) research and writing a scientific report have been acquired. In exceptional cases, and only after a motivated request by the student, the internship may be done before the MSc thesis.

Specific extra prerequisite knowledge may be necessary to start your internship. Usually the knowledge and skills gained by doing the MSc thesis before the internship will be sufficient, although, depending on the specific demands of the internship project, additional prerequisites may be necessary e.g. skills in computer programming and/or data analysis. This is to be determined by the supervisors after consultation of you as a candidate.

4.2 How to find an internship?

There are two ways to find an internship. For the first one, MSc internship topics are published on internet (<http://www.maq.wur.nl/Education>) and also on <http://tip.wur.nl>). If you find a possible internship of your interest, you should contact the internship supervisor Bert Holtslag (Meteorology; Climate Dynamics) or Wouter Peters (Air Quality and Atmospheric Chemistry). They may also provide additional internship possibilities, depending on your preferences (e.g. depending on location and/or topic) .

The second possibility is that you find an internship project yourself and arrange approval by the chair group. In both cases, part of the learning process is that you organize all arrangements with the internship providing institute yourself (see 7. Checklist for organizing an internship).

In many cases it is possible to do an internship outside the Netherlands. In that case you need extra time for preparation of visas, insurance, travel and finding accommodation.

4.3 Registration

To start an internship after a location, project and external supervisor has been found, you will have to fill out the so-called Internship contract (Appendix A). Both student and supervisor(s) sign this contract, registering mutual commitments regarding internship work. Among others, commitments are made on frequency of supervision meetings. A part of the contract is the "Project Description". All parts have to be approved by the proposed supervisors. In the "Learning Agreement" the student formulates a number of specific goals of the internship that he/she hopes to attain. In the "Self Reflection Report" (see 5.3 Internship report) the student will have to reflect on these learning goals.

The Internship Contract, once finalized (i.e. signed by all supervisors and the student), should be submitted to the secretary of the chair group in order to be added to the student database.

5 At work

5.1 Your supervisors

During your internship you will have two supervisors. The internship supervisor (on behalf of the host institution) will guide you on your work activities and give feedback on your performance. In addition, you have a Wageningen university supervisor with whom you should regularly discuss the progress in your work activities at the internship.

Your internship supervisor is an expert member of the scientific staff of the department, or of the institute where you perform internship. It is this supervisor's responsibility to keep your work in good progress. This means that he/she will

- introduce you to other members of the department whom you will meet during your research work
- introduce you into the subject
- take care of some literature to start with
- tell you where your working place is
- make a detailed time schedule together with you
- take care that you will get admission to the necessary facilities
- discuss the results with you
- discuss your draft report and your seminar
- submit an assessment once your internship has finished (see Appendix C).

A good working relation with your supervisor is a prerequisite for a good cooperation. When you encounter problems with your supervisor, you better can discuss these with him/her immediately. When this does not help, you can ask the Wageningen supervisor to assist.

5.2 Examiner

The examiner will, as a rule, be the professor of the field of research (see Chapter 2) of your internship. The examiner will be one of the persons responsible for grading the internship. (see 6. Evaluation).

5.3 The internship report

Your internship should be concluded by the writing of two reports; one about the results of your internship and one about your personal development (the reflection paper).

Report on results

Your internship supervisors should support you during the writing of your report on the tasks done during the internship. In the introduction of the report you write the goals and framework of the internship project supported by a theoretical underpinning with literature. In addition, the report should contain a description of the methods used during the internship and, if applicable, the obtained data/used body of knowledge. Finally, the report should contain the results of your internship project, a conclusion and discussion. If necessary, this can be a confidential report that only may be read and filed by the Wageningen University supervisor and examiner.

According to article 32 of the "Examination Rules" (OER) the Internship Report is written in English. However, after consultation with your examiner it is possible to write it in a different language.

Of the final version two paper copies should be submitted: one for your daily supervisor and one for the examining full professor. When your supervisor asks for more copies, the costs for these are for the

department. Inform at an early time with your supervisors when the report must be submitted to be able to have your grade in time.

Self-reflection on internship

Next to this report you have to write a report in which you reflect upon the internship itself (i.e. organisation, company, country, etc.) and upon the personal learning outcomes you formulated yourselves after discussing these with the university supervisor. 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 questions, like:

- what were the most important learning outcomes for you?
- 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?

Oral presentation

After finishing your internship you should give a presentation about your internship for the host organisation with at least the internship supervisor present and/or at the university.

5.4 Financial provisions and insurance

The host organisation may(!) provide some financial compensation for covering the cost of e.g. travel, but there is no obligation to do so. If your internship is in a European country, it is possible to apply for the Erasmus scholarship for internships (see <http://www.wageningenur.nl/en/show/LLP-Erasmus-Conditions.htm>). Sometimes grants for doing an internship are given by third parties. For more information about grants see the following website:

<http://www.beursopener.nl/content/index.asp> (in Dutch only).

Insurance

A 'normal' traveller's accidents and luggage insurance might not be sufficient if you go abroad for studying (and therefore the WUR traveller's accidents and luggage insurance is offered). Students can take out a (free) traveler's accidents and luggage insurance if they go on an internship abroad. For more information about this insurance go to SSC. If you are planning to travel after your internship you should make sure that you take out a travellers insurance for that purpose. It is always unwise to have two insurances at the same time as they might start to fight about who of them should pay for an accident. So cancel your own (continuous) traveller's accidents and luggage insurance during your study period abroad, but make sure that you have one at the moment you are planning to travel after your internship.

Students have to take out a health insurance with world coverage themselves.

All students are automatically insured for liability insurance (*Dutch: WA verzekering*) during study activities (lab work, field work etc.), but not during their leisure time.

For international students studying at Wageningen University special arrangements are made regarding insurances. For more information they should contact the SSC.

5.5 CANS/RSI prevention

(from WUR intranet)

CANS, KANS or RSI? CANS stands for: Complaints of Arms Neck and Shoulders. The Dutch term is KANS: Klachten aan Armen, Nek en Schouders. It is a collective name for complaints to fingers, hands, wrists, elbows, shoulders, neck and upper back. CANS or KANS are also known by the term RSI (Repetitive Strain Injury). Because there is no clarity about the terminology used, the terms CANS, KANS (Dutch translation) and RSI are used together. In practice, all three mentioned terms are listed.

What causes CANS and what are the symptoms? The complaints often relate to work that causes static physical stress and repeatedly requires the same movement, as is the case with computer work. Almost all university employees perform regular (persistent) computer work. PhD students working on their dissertation constitute a group that is at extra risk. In addition to computer work, other types of work can also lead to CANS complaints. A well-known example of this is pipette work.

Symptoms may range from slight tingling in the fingers to full loss of certain functions. Examples of complaints include: pain, stiffness, tingling, coordination and loss of power, temperature differences, or a feeling of numbness.

Prevention of CANS is primarily aimed at breaking the mechanisms that can lead to complaints. The best prevention is to heed the 5 Ws. The 5 Ws stand for:

- **Work tasks.** Continuously performing the same actions leads to continuous stress of the same muscles. The solution is to regularly intersperse other tasks with your computer work to prevent lack of movement. By making a phone call, taking a coffee break or doing some printing can help restore your muscles.
- **Work hours.** The longer you are sitting behind your monitor, the greater the chance of a complaint. Research has shown that the probability of complaints increases sharply if computer work is performed for over 6 hours every day. Occasionally working longer may not give rise to problems, but it is good to be aware of the relationship between the time behind the display and the risk of complaints. Break programmes help you monitor this aspect. At WUR, the Workspace break programme is automatically linked to your account.
- **Work pressure.** Peak stress, deadlines and a stressful work environment increase the likelihood of complaints. Try to avoid this as much as possible by planning properly. If you believe your schedule is too full, please discuss this with your supervisor.
- **Workplace.** Using this test, you can determine whether your computer work area is ergonomically responsible. This test is part of the CANS Arbo Catalogue of the VSNU. This catalogue contains a lot of information about CANS, compiled by experts from Dutch universities.
- **Work method.** Once you are aware of the risks and know what you can do to prevent complaints, you will be able to reduce your risk considerably. The Computer Safety Trainer will provide you with all the information you need about the risks of computer work and the options you have for managing those risks. Hotkey functions are also described here. If you work a lot using a mouse, using keyboard shortcuts can alleviate some stress in your hand and arm muscles.

Break software can help make you aware of the time you spend on your computer, provide tips, and, if you set it, alert you to take (short) breaks during your computer work. At WUR, the Workspace break programme is automatically linked to your account.

6 Assessment of the internship

Wageningen University is responsible for the assessment and grading with a mark. The internship supervisor provides advice about the mark. However, the advice from your host supervisor might differ from the mark given by Wageningen University due to differences in expectations and assessment of your work between the supervisors and differences in grading levels between organizations and countries.

For the evaluation of the performance of the student by the internship supervisor a form is given in Appendix C.

Wageningen University supervisors assess students based on an evaluation of the performance of the student by the internship supervisor and on both reports, including an evaluation interview with the examiner. For the assessment Wageningen University supervisors use the form Assessment Internship Wageningen University; see Appendix C.

In Appendix D you can find an assessment tool which is called a Rubric that may be used as a guideline to determine the mark for your internship.

Examination

After finishing your report, the self-reflection report and the oral presentation you will have an oral examination with your Wageningen University supervisor or the examiner of your internship, possibly the internship supervisor is present as well. They will evaluate to what extent you master the subject of your internship and the quality of your reflection on the internship project.

Honours

A student may graduate “With honours” (*Cum Laude*) if the following criteria are met:

- average grade (excluding thesis and internship) at least 8.0
- thesis grade at least 9.0
- internship (or minor thesis) at least 8.0

In very special cases the Examination Committee may deviate from these rules.

7 Checklist for organizing an internship

For all internships:

- ✓ Find an internship
- ✓ Find a supervisor
- ✓ Fill in Wageningen University Internship Contract and Learning Agreement together with Wageningen University supervisor and internship supervisor
- ✓ Hand in Wageningen University Internship Contract and Learning Agreement at:
 1. the secretary of the supervising chair group
 2. the study advisor of your study programme.
- ✓ If applicable fill in the internship contract of the host institution

For internships abroad:

- ✓ If possible apply for grants
- ✓ Arrange proper insurances
- ✓ Make sure you have the right vaccinations for the country you are travelling to.
- ✓ Apply for a visa
- ✓ Arrange tickets
- ✓ Arrange housing
- ✓ Fill in the form ‘OV studentenkaart buitenland’ and hand in your OV card in order to receive a refund of travelling costs (for Dutch students only)

Appendix A. Internship contract

Wageningen University Internship Contract and Learning Agreement

This Internship Contract and Learning Agreement¹ serves to lay down the agreement on the internship between the student, the employer and the university.

Signed copies have to be sent to the student and his/her study advisor, the supervisors on behalf of the employer and university.

Internship contract (hereinafter: "the Contract")

Parties:

Student

Last name: _____ (hereinafter: "the Student")
First name: _____
BSN ('sofinummer'): _____
Date of birth: _____
Place of birth: _____
Address: _____
Postal code and town: _____
Telephone number: _____
Nationality: _____

Internship provider

Name: _____ (hereinafter: "the Employer")
Address: _____
Postal code and town: _____
Country: _____
Represented by: _____
Email representative: _____

University

Name: _____ Wageningen University (hereinafter: "the University")
Address: _____ Post office box 9101
Postal code and town: _____ 6700 HB Wageningen
Country: _____ The Netherlands
Chair group: _____
Represented by: _____
Email representative: _____

Whereas:

1. the Student is registered at the University based on a teaching agreement;
2. an internship is part of the master programme:

Article 1.

The internship will start on _____ and will end
on _____

¹ Wageningen University, Educational Institute, 15.08.2011

The Employer shall offer the Student the opportunity to have an internship at its offices /premises. The Employer shall only assign those tasks to the Student that have a clear relationship with the objects of the internship as described article 2.

The internship shall be at _____ (place of work).

The time to be spent at the work placement is in accordance with normal full time working hours, except if it is agreed otherwise and not contrary to employment legislation for youngsters.

Article 2.

The subject/topic of the internship is entitled:

.....

The university code of the internship is:

.....

The internship programme (description of the project) is attached as annex 1 to this Contract.

This programme may be changed from time to time pursuant to a written agreement between the Employer, the University and the Student.

In a Learning Agreement, attached as annex 2 to this Contract, the Student and the (supervisor of the) University have laid down the arrangements made in respect of the learning outcomes and the assessment of the internship.

Article 3.

The internship supervisor at the side of the Employer is:

.....

Article 4.

The supervisor² at the side of the University is:

.....

Article 5.

The Student shall write a report and a self reflection paper (that can be included in the report or a separate paper) at the end of his/her internship. Moreover the Student shall give a final oral presentation about his/her internship at the University and/or (if agreed so) at the work placement. The Student shall send the report and reflection paper, and (if applicable) a PowerPoint paper of his/her presentation at the work placement to the University.

Article 6.

The internship supervisor at the side of the Employer shall fill in an evaluation form on the performance of the Student. The final assessment and marking is the responsibility of the supervisor and examiner at the side of the University.

Article 7.

The Student shall meet the requirements of the Employer regarding safety, health, labour hours/ holiday and confidentiality, etc. If requested so by the Employer the Student and the Employer shall conclude a secrecy agreement, provided however that the Student always keeps the right to present the results of his/her internship

² This can be another staff member than the representative of the chair group.

on the way as described in article 5. In the event of a conflict between the terms of such secrecy agreement and the terms and conditions of this Contract, the latter shall prevail.

Intellectual property rights being the results of the internship will belong to the Employer. However, the Student has always the right to publish these results in the way as described in article 5. In the event that (part of) these results must be kept confidential for reasons of vesting an intellectual property right in the name of the Employer, the latter may request that dissemination of the relevant results will take place in a closed assessment meeting.

Article 8.

The Student must inform both supervisors on absence and return from absence.

Article 9.

In the performance of the activities being part of the internship, nor the Student, nor the University will be liable towards the Employer and/or any third party for any damage or loss, except when the Student is liable for damage or losses being the result of willful conduct or gross negligence.

The Employer shall indemnify and hold the Student and the University harmless for third party claims in respect of direct and indirect damage and losses.

The Employer shall take care for an adequate insurance of the Student similar to the one which is in place for its employees.

Anyway the University has taken out liability insurance on which policy the liability (if any) for both the University and the Student is covered.

Article 10.

The Employer is responsible for the withholding of (income) taxes and premiums for social security and premiums as far as applicable and shall indemnify and hold the Student and the University harmless for third party claims to that extent.

Article 11.

In case of accidents either at work or on the way to or from work, the Student shall inform the supervisor at the side of the University immediately.

Article 12.

The Student receives a gross allowance of monthly at a fulltime workweek:

€

The allowance for travelling is:

€

The holiday allowance is:

€

Other allowances

€

Article 13.

This Contract will terminate automatically:

1. at the end of the internship period as referred to in article 1;
2. at the moment that the Student is not registered anymore as a student of the University;
3. upon mutual written consent between the Student, the Employer, and the University.

Article 14.

The Employer may early terminate this Contract after consultation of the Student and the University if the Student does not perform pursuant the terms of this Contract, more specifically if the Student acts in violation with the rules as referred to in article 7, provided however that the Employer has issued a prior written warning to the Student.

Article 15.

In case of conflicts the Student shall try to solve the problem with the supervisor on the side of the Employer. If they do not reach a solution of the problem(s), the problem will be discussed with supervisor on the side of the University.

Article 16.

This Contract shall be governed by Dutch Law. General terms and conditions of the Employer, whatever named, shall not be applicable to this Contract. Disputes will be amicably settled between the Parties. If an amicable solution cannot be reached the Civil Court in Arnhem, the Netherlands, will be the competent court

Agreed and signed by

Employer

Student

Wageningen University

Place:

Date:

Annex 1 Internship Programme (Project Description)

Project and execution:

Annex 2 Learning Agreement³

The specific learning outcomes for this work placement are:

The requirements on the report of the work placement are:

The Excel form [Assessment Internship Wageningen University](#)⁴ will be used.

³ This is an agreement between the student and the university supervisor.

⁴<https://portal2.wur.nl/sites/OWI/kwaliteitszorg/Policy Documents and Forms/Internship assessment form.>

The percentages used in the assessment form will be:

Learning outcomes (assessment criteria)	percentage
A. Professional skills	45
B. Report internship	40
C. Self-reflection on internship	10
D. Presentation	5
E. Examination	0

The assessment will be done in week

Agreed and signed by

Student

University supervisor

Appendix B. Evaluation form for the internship supervisor

Internship evaluation Wageningen University

Report of the final evaluation meeting at the end of the internship period

Name student:

Registration number:

Company/Organisation:

Name supervisor(s):

Email address:

Date of final evaluation meeting :

1. The task(s) of the student during the internship period:

(summary of the internship plan)

2. The results of the work during the internship period:

(short description of results, confidentiality, oral and written reporting)

3. Performance of the student during the internship period

(energy, interest, responsibility, independency, punctuality, cooperation, 360 ° review, etc.)

4. Judgement on the student from the internship supervisor:

(Mark a category, if possible, the personal skills mentioned below)

For a description of the marks within these categories use the rubric in Appendix E.

Assessment of professional skills	2-3	4-5	6	7	8	9-10
Initiative and creativity						
Insight in functioning in another organisation						
Adaptation capacity						
Commitment and perseverance						
Independence						
Handling supervisor's comments and development skills						
Time management						
Presentation; graphs, structure						
Oral presentation and defence						

5. Student's opinion about his/her future career

(and the advice of the internship supervisor(s))

Name and signature of the internship supervisor

Name and signature of the student

Date:

Date:

To be filled in by Wageningen University:

Name and signature of the responsible internship coordinator of Wageningen University.

Date:

Course code:

Appendix C. Criteria for the assessment of an internship

The performance of the student in relation to the internship is based on:

1. Professional skills (weight 45%)
 - Initiative and creativity
 - Insight in functioning of another organisation
 - Adaptation capacity
 - Commitment and perseverance
 - Independence
 - Handling supervisor's comments and development of skills
 - Time management
2. Internship report (weight 40%)
 - Formulation goals, framework project
 - Theoretical underpinning, use of literature
 - Use of methods and processing data
 - Reflection on results
 - Conclusions and discussion
 - Fluency of language and writing skills
3. Self-reflection on internship (weight 10%)
 - Report on self-reflection
4. Presentation (weight 5%)
 - Presentation: graphs, PowerPoint
 - Oral presentation and defence

The explanation of the above terms and the grades corresponding to your own efforts are summarized below in the rubrics.

The grades for each of the items above are inserted in a spreadsheet and the final grade is calculated using the relative weights. Then final grade is then rounded off to the nearest 0.5 interval

Appendix D. Rubric for assessment of MSc-internship

Check the latest version of the rubrics on (<https://teamsites.wur.nl/sites/owi/diversen/owi%20reference%20site.aspx>)

Manual for use of MSc-internship assessment rubric (version 1.0) to be used in conjunction with the internship evaluation form of Wageningen University

User instructions

- The assessment form has the form of an analytic rubric (see e.g. Andrade (2005), Reynolds *et al.* (2009), URL1, URL2). Each line discusses one **crit**erion for assessment. Each column gives a **level** for the grading. Each cell contains the **descri**ptor of the level for that criterion.
- The criteria in the rubric exactly follow the items presented in the Excel worksheet “Internship evaluation Wageningen University” constructed by the OWI. In a few cases the criteria in the original thesis evaluation document were split into two or more parts because the description of the criteria clearly covered different subjects. The average mark for the different subject should be given in those cases. A mark should be given for all items mentioned in **bold**.
- Since the final mark is composed of so many criteria, the scores on individual criteria should be discriminative. Not all levels are equally broad in marks. Since the final marks of these usually range between 6 and 9 individual levels have been established for the marks of 6, 7 and 8. When performance is at the 9-10 level, decide whether the student is on the low edge (9) or high edge (10) of this level. Descriptions at the 9-10 level tend to describe the ultimate performance (10). Hence, if a student performs well above 8, but below the description at the 9-10 level, a 9 would be the appropriate mark.
- Keep in mind that each line in the rubric should be read independently: it could be that a student scores a 2-3 on one criterion and a 9-10 on another.
- Always start at the lowest mark, and test if the student should be awarded the next higher mark. In some cases achievements of a next lower level are not repeated at the higher level (i.e. the lower level achievements are implicit in the higher levels). Furthermore, if a level has a range of marks, choose the most appropriate one (consider the description of the level of performance as a continuum, rather than a discrete description).
- Wherever the student is indicated as ‘he’, one can also read ‘she’.
- Please report any positive or negative experiences and suggestions to marjolijn.coppens@wur.nl.

Remarks

- The main intention of using a rubric is enhance homogeneity of assessments and the ability to communicate about assessments both with students and with colleagues. Furthermore, it clarifies to students the expectations of the supervisor and helps the supervisor to structure feedback during the process of thesis research.
Although the intention is to homogenize the process of assessment, it should be noted that even with the use of a rubric some arbitrariness will remain.
- We suggest that all main categories (groups of criteria: research competence, thesis report, colloquium, examination) should have an assessment of 'sufficient' (i.e. a '6') before the total thesis work can be considered as sufficient. So, no compensation between main categories is possible to obtain a final mark of '6'.

- Author of the rubric: Marjolijn Coppens, with valuable contributions from Arnold F. Moene, Ralf Hartemink, Jan Philipsen, Maria Smetsers, Paul Hebinck, Tjeerd Jan Stomph, Judith Gulikers.

References

Andrade, H.G, 2005. Teaching With Rubrics: The Good, the Bad, and the Ugly. *College Teaching* **53**, p. 27-31.

Reynolds, J., R. Smith, C. Moskovitz and A. Sayle, 2009. BioTAP: A Systematic Approach to Teaching Scientific Writing and Evaluating Undergraduate Theses. *Bioscience* **59**, p. 896-903.

URL1: <http://jonathan.mueller.faculty.noctrl.edu/toolbox/rubrics.htm> (last visited November 17, 2009).

URL2: [http://en.wikipedia.org/wiki/Rubric_\(academic\)](http://en.wikipedia.org/wiki/Rubric_(academic)) (last visited November 17, 2009).



Rubric for assessment of MSc-Internship

Author: Marjolijn Coppens with contributions of Arnold F. Moene, Judith Gullikers, Jan Philipsen, Maria Smetsers, Paul Hebinck, Tjeerd Jan Stomph, Ralf Hartemink.

Based (in part) on 'Rubric for assessment of MSc-thesis' by Arnold F. Moene (Version: 1.0)

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Item	Mark for item					
	2-3	4-5	6	7	8	9-10
A. Professional skills (40%) *						
1.1. Initiative and creativity	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 project.	Student initiates discussions on new ideas with supervisor and develops one or two own ideas on minor parts of the project.	Student has his own creative ideas.	Innovative methods and analysis of information/data. Possibly the idea for the project has been formulated by the student.
1.2 Insight in functioning of another organization	Student shows no insight in functioning of the organization.	Student shows no insight in functioning of the organization.	Student is able to draw an organization chart of the organization.	Student is able to indicate the position of the team within the organization as a whole.	Student is able to indicate the responsibilities of the different units within the organization.	Student knows how changes are realized in the organization.
	Student doesn't ask for help from the internship provider in case it is necessary.	Student doesn't ask for help from the internship provider in case it is necessary.	Student gets things (e.g. receiving information, organizing material facilities, etc.) done within the team only via internship supervisor.	Student is able to get some things (e.g. receiving information, organizing material facilities, etc.) done within the team. If necessary, the student asks for help of the supervisor to get things done within the team.	Student is able to get things (e.g. receiving information, organizing material facilities, etc.) done within the team independently.	Student is able to independently implement changes that affect the whole team.
1.3 Adaptation capacity	Student doesn't adapt and gives an impression of apathy or is often involved in disputes or arguments.	Student doesn't adapt and gives an impression of apathy or is often involved in disputes or arguments.	Student knows the do's and don't in the new work environment.	Student accepts how things go within the new work environment.	Student is able to adapt to the new work environment.	Student adapts easily to the work environment within the limits of his personal values.
1.4 Commitment and perseverance	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 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.
1.5 Independence	The student can only perform the work 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.

Item	Mark for item					
	2-3	4-5	6	7	8	9-10
1.6 Handling supervisor's comments and development skills	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 professional 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 academic level, i.e. he explores solutions on his own, increases skills and knowledge where necessary.
	No learning outcomes formulated.	Learning outcomes formulated, but no progress in any of them.	On some of the personal learning outcomes the student shows some progress.	On all of the personal learning outcomes the student shows some progress.	On some of the personal the student shows major progress and on others some progress is shown.	On all personal learning outcomes the student has shown major progress.
1.7. Time management	No time schedule made.	No realistic time schedule.	Mostly realistic time schedule, but no timely adjustment of time schedule if necessary.	Realistic time schedule, with some adjustments if necessary (but not enough or not all in time) in times only.	Realistic time schedule, with if necessary timely adjustments of times only.	Realistic time schedule, with if necessary timely adjustments of both time and tasks.
	Final version of internship report or presentation more than 50% of the nominal period overdue without a valid reason (force majeure)	Final version of internship report or oral presentation at most 50% of the nominal period overdue (without a valid reason).	Final version of internship report or oral presentation at most 25% of nominal period overdue (without valid reason)	Final version of internship report or oral presentation at most 10% of nominal period overdue (without valid reasons)	Final version of internship report or oral presentation at most 5% of nominal period overdue (without good reasons)	Final version of internship report or oral presentation finished within planned period (or overdue but with good reason and finished within reasonable time).
B. Report internship (40%)						
2.1 Formulation goals, framework project	No goals and framework of project.	Formulation of goals and framework of project is not clear.	Formulation of goals and framework of project is clear, but link between tasks and goals is not clear. Framework of project does not fit with the object of the internship project.	Formulation of goals and framework of project is clear, but link between tasks and goals is not always clear.. Framework of project does not fit with all aspects of the internship project.	Formulation of goals and framework of project is clear.	Clear formulation of goals and framework of project. Both are well linked with all aspects of the internship project.
2.2. Theoretical underpinning, use of literature	No discussion of underlying theories.	There is some discussion of underlying theories, but the description shows serious errors.	Student has found the relevant theories, but the description has not been tailored to the project at hand or shows occasional errors.	Student has found the relevant theories, and has been partially successful in tailoring the description to the project at hand. Few errors occur.	Student has found the relevant theories, makes a synthesis of those, and has been successful in tailoring the description to the project at hand.	Clear, complete and coherent overview of relevant theories. Exactly tailored to the project at hand.

Item	Mark for item					
	2-3	4-5	6	7	8	9-10
	No relevant literature in reference list except for those already suggested by the supervisor	Only a couple of relevant literature references in the reference list.	Some relevant literature in reference list but also significant body of irrelevant literature.	Relevant literature in reference list but some references are less relevant.	Used literature is relevant for the goal of the project. An occasional reference may be less relevant.	Used literature is relevant for the goal of the project.
2.3. Use of methods and processing data	No description of methods and analysis of the information/data.	Insufficient information on methods and insufficient analysis of the information.	Some aspects of the project regarding methods and analysis of information are described insufficiently. Used methods and analysis of data/information are not always appropriate.	Description of methods and analysis of information/data is lacking in a number of places. Used methods and analysis of data/information mostly appropriate.	Description of methods and analysis of information/data is mostly complete, but there are lacking some details. Used methods and analysis of data/information are appropriate.	Description of methods used and analysis of the information is appropriate, complete and clear.
2.4. Reflection on results	No reflection on the results of internship project. Discussion only touches trivial or very general points of criticism.	Student identifies only some possible weaknesses and/or points at weaknesses which are in reality irrelevant or non-existent.	Student indicates most weaknesses in the results, but does not weigh their impact on the main results relative to each other.	Student indicates most weaknesses in the results and is able to weigh their impact on the main results relative to each other.	Student indicates all weaknesses in the results and weighs them relative to each other. Furthermore, (better) alternatives for the methods used are indicated.	Student is not only able to identify all possible weaknesses in the results, but is also able to indicate which weaknesses affect the outcome of the internship project most.
2.5. Conclusions and discussion	No link between goals, results and conclusions.	Conclusions are drawn, but in many cases only address part of the goals. Conclusions merely repeat results or conclusions are not substantiated by results.	Conclusions are linked to the goals, but not all goals are addressed. Some conclusions are not substantiated by results or merely repeat results.	Most conclusions well-linked to goals and substantiated by results. Conclusions mostly formulated clearly but some vagueness in wording.	Clear link between goals and conclusions. All conclusions substantiated by results. Conclusions are formulated exact.	Clear link between goals and conclusions. Conclusions substantiated by results. Conclusions are formulated exact and concise. Conclusions are grouped/ordered in a logical way.
2.6. Fluency of language and writing skills	No discussion about the added value of the project for the organization. Internship report is badly structured. In many cases information appears in wrong locations. Level of detail is inappropriate throughout.	Student assigns irrelevant aspects of the project as added value for the project for the organization. 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).	Student only reflects on trivial aspects of his project for the organization and does not relate this to the goals of the organization. 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	Student is able to identify the added value of his project for the organization, but does not relate this to the goals of the organization. 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).	Student is able to identify the added value of his project for the organization and relates this to the goals of the organization. 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.	Student is able to identify the added value of his project and relates this to the goals of the organization. In addition, the student is able to indicate the added value of his project for the society as a whole. 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.

Item	Mark for item					
	2-3	4-5	6	7	8	9-10
			information given).			
	Formulations in the text are often incorrect/inexact inhibiting a correct interpretation of the text.	Vagueness and/or inexactness in wording occurs 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. Internship report could have been written more concisely.	Formulations in text are clear and exact, as well as concise.	Textual quality of the internship report is such that it could be acceptable for a peer-reviewed journal.
C. Self reflection on internship (10%)						
3.1 Report on self reflection	Is not able to describe an event or situation in which he was involved and that relates to a formulated learning outcome.	Is able to describe at least one event or situation in which he was involved and that relates to a formulated learning outcome but unable to distinguish between the event description and the description of the personal emotions involved.	Is able to describe at least one event or situation in which he was involved and that relates to a formulated learning outcome, properly distinguishing between the event description and the personal emotions involved, but unable to formulate personal points of improvement and related actions in a future situation	Is able to describe at least one event or situation in which he was involved and that relates to a formulated learning outcome, properly distinguishing between the event description and the personal emotions involved, and able to formulate personal points of improvement and related actions in a future situation	Is able to analyze objectively most events or situations in which he was involved and that relates to formulated learning outcomes, derive improvements for a future situation and formulate plan for improved functioning in a new situation. Shows the ability in at least one case to implement the formulated plan for improved functioning	Is able to analyze objectively any event or situation in which he was involved and that relates to formulated learning outcomes, derive improvements for a future situation and formulate and implement a plan for improved functioning in a new situation.
D. Presentation (5%)						
4.1. Presentation: Graphs, PowerPoint	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 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.
4.2. Oral presentation and defense	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. Sometimes monotonous in some places.	Clearly spoken in such a way that I keeps audience's attention.	Relaxed and lively though concentrated presentation. Clearly spoken in such a way that I keeps audience's attention.
	Language and interest of audience not taken into consideration at all.	Language and interest of audience hardly taken into consideration.	Language and interest of presentation at a couple of points not appropriately targeted at audience.	Language and interest of presentation mostly targeted at audience.	Language and interest of presentation well-targeted at audience. Student is able to adjust to some extent to signals from audience that	Take-home message is clear to the audience. Language and interest of presentation well-targeted at audience. Student is able to adjust to signals from

Item	Mark for item					
	2-3	4-5	6	7	8	9-10
					certain parts are not understood.	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 20% deviation from planned time).	Timing is OK (at most 10% deviation from planned time).	Presentation finished well in time.	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.
E. Examination (5%)						
5.1 Defense of the report	Student is not able to defend/discuss his internship reports. He does not master the contents.	The student has difficulty to explain the subject matter of the internship project.	Student is able to defend his internship project. 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 internship project. 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 internship project, including indications how 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 internship project and to place the internship project in the context of current scientific literature and practical contexts.
5.2 Reflection on the internship	Is not able to describe an event or situation in which he was involved and that relates to a formulated learning outcome.	Is able to describe at least one event or situation in which he was involved and that relates to a formulated learning outcome but unable to distinguish between the event description and the description of the personal emotions involved.	Is able to describe at least one event or situation in which he was involved and that relates to a formulated learning outcome, properly distinguishing between the event description and the personal emotions involved, but unable to formulate personal points of improvement and related actions in a future situation	Is able to describe at least one event or situation in which he was involved and that relates to a formulated learning outcome, properly distinguishing between the event description and the personal emotions involved, and able to formulate personal points of improvement and related actions in a future situation	Is able to analyze objectively most events or situations in which he was involved and that relates to formulated learning outcomes, derive improvements for a future situation and formulate plan for improved functioning in a new situation. Shows the ability in at least one case to implement the formulated plan for improved functioning	Is able to analyze objectively any event or situation in which he was involved and that relates to formulated learning outcomes, derive improvements for a future situation and formulate and implement a plan for improved functioning in a new situation.