



MSc Thesis Course Guide Wageningen University

- Part A: information about MSc theses at WU
- Part B: chair group specific regulations

Additional information specific to programmes or chair groups is provided online (via Brightspace and/or webpages).

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Part A: Information about MSc theses at WU

1. General information

This course guide describes the procedures for the MSc thesis supervision and writing process for all chair groups of Wageningen University. This course guide applies to both compulsory and extra theses. It is meant for staff and students. It includes information about the goal of the thesis, the necessary procedures before starting and during the thesis, as well as the assessment procedure.

A separate course guide applies to the *Research Practice*. This is a thesis-like project with additional learning outcomes and related assessment criteria that – depending on the programme and individual arrangements made with the Examining Board – may be done instead of an internship.

Course profile

The MSc thesis enables the student to put their acquired knowledge and skills into practice by individually and independently conducting a research project within the scope of their programme.

Language: English

Credits: 30 - 39 EC (compulsory theses) or 24 - 33 EC (extra theses)*

Period: The start date of your thesis is determined in consultation with your thesis supervisor

* Most study programmes require a minimum of 36 credits for the compulsory thesis; see the Study Handbook for more information. As a guideline, a full-time thesis of 36 credits (EC) equals 24 weeks of 42 hours/week or 26 weeks of 40 hours/ week).

You may choose to include an extra thesis as part of the electives in your study programme. The extra thesis has a minimum size of 24 EC: 16 weeks of 42 hours/week or 17 weeks of 40 hours/week. Only in consultation with the thesis coordinator (of the chair group) and your study adviser, can you extend the length of your (compulsory) thesis to a maximum of 39 credits.

Specific requirements (e.g. mandatory courses) for each MSc thesis can be found in the online Study Handbook. Please check with your study adviser for any programme specific requirements. Finally, you should be officially registered as a Wageningen University MSc student.

Learning outcomes

After the successful completion of your MSc thesis, you are expected to be able to *independently* carry out the following aspects of a research project:

1. Develop a research plan, including: a description of the research topic in relation to the wider scientific context; an identification of the knowledge gap; formulation of research questions and/or a hypothesis, aims and objectives; an explanation of how you intend to conduct the research (e.g. in terms of a design for the project, data-collection and -analysis methods, research tools).
2. Collect, select and process data, using the design for the project, methods and tools described in the research plan.
3. Analyse and synthesise the data in order to answer the research questions and/or test the hypothesis.
4. Formulate answers to the research questions that are supported by the research outcomes; pay attention to potential limitations; critically discuss the outcomes in relation to the wider scientific and societal context.
5. Report on the research, both in writing and in oral presentation.

6. Work in compliance with academic codes of conduct and with proper management of time and resources.
7. Make use of input and feedback for executing the research project and provide feedback to others.

2. Preparation of your thesis

The supervision of your thesis is the responsibility of a Wageningen University chair group. Your study programme determines which chair groups are entitled to supervise your thesis project. Consult the description of your MSc programme in the Study Handbook and contact your study adviser to find out more about the chair group(s) allowed to supervise your thesis. If you find a thesis topic that does not meet these criteria, but which, in your opinion, is extremely relevant for your programme, you should contact your study adviser and ask for approval from the Examining Board.

People involved in your thesis

- The *thesis coordinator* is the contact person within the chair group. You can find thesis coordinators of each of the chair groups in the online Study Handbook of Wageningen University. The thesis coordinator appoints a supervisor and an examiner from the chair group.
- The *supervisor* is a staff member of the chair group and responsible for the supervision of your thesis. Especially in lab theses, the daily supervision often is delegated to a PhD student. Supervisors from external organisations cannot have a formal role and cannot be involved in the grading.
- The *examiner* will be the chair holder or another staff member appointed by the Examining Board. The examiner is responsible for the final grading.

How to find a thesis (topic)

There are differences between chair groups with regard to how theses should be found and arranged. In general, you can take the following steps:

- Attend a thesis information meeting, organised by your MSc programme or the chair group. In a few programmes, you need to participate in a thesis allocation procedure.
- Contact your study adviser to discuss the options for thesis subjects.
- Visit the Wageningen University websites of chair groups that are entitled to supervise an MSc thesis within (the specialisation of) your study programme.
- Find thesis subjects via the thesis database at WU-website (this database is still under construction).
- Make an appointment with the thesis coordinator of the chair group and discuss which thesis subject(s) you are interested in. Names of thesis coordinators can be found in the online Study Handbook.

The thesis subject should preferably match the overall research field of your programme. You must discuss both the topic and timing with your study adviser and the thesis coordinator of the chair group in a timely manner, especially if your thesis includes an experiment or field work abroad: this can sometimes take several months to arrange.

Learning Agreement

Before the thesis starts, you and your supervisor have to discuss and agree on the content of your thesis. The *Learning Agreement* (see overview of downloads in Appendix II) contains a description of the thesis topic, the agreements on supervision, planning, data management plan, evaluation moments, and (if applicable) risk assessment. You and your supervisor must discuss and sign the Learning Agreement. The Learning Agreement will be archived in OSIRIS.

Discuss possible confidentiality issues with your supervisor. In principle, your MSc thesis is not considered confidential, however, if part of your results is used in a larger research project, contract research or research that is subject to patenting, then confidentiality agreements may apply. You

should be informed by the thesis supervisor prior to starting if your thesis is part of a contract research programme or a patent procedure.

Discuss time, format and transfer of results and data with your supervisor as well (these are part of the data management plan) and include arrangements in the Learning Agreement. If the chair group use a specific format for a data management plan, this is included in the chair group specific regulations in this course guide (Part B).

Information on WU travel policy, insurance and grants

Travel policy for students

Are you planning to travel abroad or, as an international student, are you temporarily travelling back home in the context of your studies at Wageningen University & Research? Find out in good time whether this trip concerns a **risky area** (source: Dutch Ministry of Foreign Affairs). If so, you will have to receive permission. If this is relevant to you, you should submit a **travel request** together with your thesis coordinator.

You will need to complete a form that also functions as a checklist to ensure that you are well-prepared for your trip. This checklist includes precautions to be taken – both mandatory and otherwise – such as travelling together with a student who is already familiar with the area, (additional WU) insurance, safety training, registration in Kompas (Foreign Affairs), and recommended vaccinations. You can find the form on the website mentioned below.

For actual information on travel policy WU, check the website:

<https://www.wur.nl/en/Education-Programmes/Current-Students/Travel-policy-for-students.htm>

Travel Insurance

Students participating in internships and/or conducting thesis work abroad as part of their study programme at the University are covered by the collective travel insurance of Wageningen University & Research. You do not need to pay to make use of this collective travel insurance. More information you can find here (heading Collective Travel Insurance):

<https://www.wur.nl/en/Education-Programmes/Current-Students/Insurance.htm>

Grants

There are some possibilities to apply for grants if your thesis, internship or research practice takes place in a foreign country, but most times the chance to receive a grant is small. For information about grants, see the following websites:

- <https://www.wur.nl/en/Education-Programmes/Study-Abroad-and-Exchange-Students/Outgoing-from-Wageningen-University.htm>
- <http://www.beursopener.nl/content/index.asp> (unfortunately in Dutch only)
- <https://www.wur.nl/en/Education-Programmes/master/Study-grants.htm>
- <https://www.wur.nl/en/Education-Programmes/Current-Students/Travel-Funding.htm>

3. Points of attention during the thesis

Supervision

Each chair group organises the appointment of supervisors differently. Contact the thesis coordinator of the respective chair group to check their specific procedure.

The first (main) supervisor is always a staff member of the responsible chair group, but sometimes, a second or even a third chair group may be involved in the supervision of an MSc thesis. In general, students are entitled to have regular meetings (e.g. every two or three weeks) with the primary supervisor. The actual frequency of meetings may vary depending on the nature of the thesis project. In order to make the meetings effective, the student needs to prepare for them, for example by preparing documents for the meeting (e.g. a chapter of the thesis or a list of discussion points) and by sending the document to the supervisor well in advance of the meeting. The supervisor, in turn, is expected to read the documents sent to them and to discuss them with the student during the meeting. As the thesis project is a learning experience, students are encouraged to act independently when resolving problems or in difficult situations. However, in cases of urgency, the supervisor should be available for feedback and support in between the regular meetings. Agreements on how to deal in such situations should be included in the Learning Agreement.

Ethical behaviour and plagiarism

Attention to scientific integrity is an important aspect of your academic education, including the various aspects that are relevant for an academic researcher. You always have to be aware of the fact that you could get into an ethical dilemma and you should be prepared if you run into such a situation. We refer to the Wageningen Code of Conduct for Scientific Practice (see Appendix I).

The main aspects described in this code concern:

- **Scrupulousness:** Scientific activities are performed scrupulously, unaffected by mounting pressure to achieve.
- **Reliability:** Science's reputation of reliability is confirmed and enhanced through the conduct of every scientific practitioner. A scientific practitioner is reliable in the performance of their research and in the reporting, and in the transferring of knowledge, through teaching and publication.
- **Verifiability:** Presented information is verifiable. Whenever research results are publicised, it is made clear what the data and the conclusions are based on, where they were derived from and how they can be verified.
- **Impartiality:** In their scientific activities, the scientific practitioner needs no other interest than the scientific interest. In this respect, they are always prepared to account for their actions.

A summary of the Wageningen Code of Conduct for Scientific Practice is given in Appendix I.

You are expected to be familiar with proper citing and referencing techniques before you start writing the thesis and are advised to consult relevant information available on the WUR-website (e.g. '[Citing and referencing](#)'). Improper citing and referencing may be considered as plagiarism, which is a form of fraud. Staff are expected to screen all writings carefully for similarity with known sources; the University has made software available for this purpose. In case of suspicion of plagiarism, either of text, figures, models or data, the Examining Board will be informed. In the Rules and regulations of the Examining Board, procedures and sanctions regarding fraud are described.

Progress evaluation

The progress evaluation is a meeting between student and supervisor that takes place before you are

halfway through the project. It is up to the chair group if this meeting is scheduled right after the completion of the research proposal or later on, but should be agreed upon with the student in the Learning Agreement. In this meeting, all aspects of the thesis project at that point (i.e. research proposal, supervision, performance) are discussed. The principle of two-way feedback applies to the progress evaluation: if you have experienced any shortcomings in your supervision, then this is a good moment to discuss them and make agreements on potential improvements. In case of severe problems regarding your dedication, skills, knowledge or communication, your supervisor and the thesis examiner, may decide to terminate the thesis project. The outcome of the evaluation will be discussed with you and will be registered in OSIRIS afterwards.

The thesis assessment form and rubric can be used for the evaluation of the progress and provide a clear picture of what is going well and where improvement may be needed. If progress has not been achieved as planned due to reasons beyond your control (e.g. illness, problems in supervision), the plan for the rest of the project may need to be adjusted and new, feasible end goals defined.

Meetings

During your thesis period, you may participate in work discussions and other meetings of the chair group. Many chair groups have weekly work discussions in which research progress of all group members is discussed. Depending on the chair group, you may be asked to join the discussion group that is related to your research topic. Ask your supervisor when your chair group holds discussion sessions.

Both students and staff present their results to the other members of the chair group during colloquia. In general, students have to attend these colloquia.

Some chair groups organise literature discussions on papers that are relevant to their field, or organise seminars, during which guest researchers present their research or designs.

4. Thesis activities

This section describes the different stages of the thesis project in general terms. See Part B of the course guide for the specific requirements of your chair group.

Research proposal/ planning

At the start of the thesis, you will discuss the topic with your supervisor and read literature related to the project. After this initial orientation, you write a research proposal, which has to be discussed in depth with your supervisor(s). The research proposal should include a problem statement, research questions or a hypothesis that is supported by up-to-date literature related to the topic, an explicit and specific plan regarding how the research is to be conducted (e.g. study design, data collection and analysis methods) and a time schedule.

If drafted correctly, sections of the proposal can be used to write the final thesis report (e.g. the Introduction and Methodology sections). However, you cannot start conducting the research project before the research proposal has been approved by your supervisor(s).

When your proposal is completed, you may be asked to present your research proposal to other students and staff members in order to acquire feedback and suggestions for improvement. Discuss format and content for your presentation with your supervisor. The presentation should be given in English in order to allow international students and staff members to participate in the discussion.

Carrying out the research project

You should document your research activities, findings and sources carefully, including seemingly small details. During data collection, analysis and synthesis, you should follow the agreements made in the data management plan. In experimental research, a lab or field journal has to be kept.

You are recommended to keep in close contact with your supervisor throughout the project. Should unforeseeable circumstances occur, you will have to adapt your research proposal; any changes in planning must be discussed with and approved by your supervisor.

Feedback

Dealing with feedback and providing feedback to others is one of the learning outcomes of the thesis. While carrying out your project and attending meetings, there will be ample opportunities for you to ask for and receive feedback from staff and students, and to give feedback to others as well. The chair group will request that you participate in peer-learning sessions. Using this input will help you to further develop your knowledge, skills and attitude and make the best of your project.

Thesis report

Your research should result in a comprehensive, consistent and concise thesis report. It is important to realise that the thesis is not a chronological account of the project or a summary of the lab-journal. Furthermore, as good scientific writing dictates, the results should be properly organised and data should be correctly processed, analysed and presented. In principle, an MSc thesis report should contain all the elements of a full scientific paper in your discipline (see Part B for specific criteria for your chair group).

In some cases, it may be possible to write your thesis in the format of a scientific article, which is usually much shorter than a regular thesis report. Discuss this with your supervisor. Publication of the results of your research in proceedings or a scientific article is also possible. The supervisor of the chair group will generally be co-author of any publications originating from thesis work.

You usually get one possibility to discuss a draft report with your WU supervisor before handing in the final report. In many chair groups it is common practice to discuss chapters separately in the final

stage of the project.

Oral presentation (Colloquium)

Once your research has been completed, you are required to present your thesis and your major findings to other students and staff members of the chair group. Chair groups usually have a fixed schedule for these presentations. Appointments for a date, and the publication of the announcement should be made well in advance. You may discuss the structure and content of your presentation with your supervisor in advance so they can offer feedback and advice. The presentation must be in English so international staff and students can participate in the discussion.

Oral defence

The final oral defence is a discussion with your supervisor, the examiner and, in some cases, a supervisor from outside the chair group not involved in the grading of the thesis. The discussion focuses on the content of the thesis, in which your knowledge, understanding, insights, as well as creativity and scientific attitude are evaluated. You are expected to be able to place your results and conclusions in the wider context of the field of science. The oral defence will be scheduled ten working days after you have submitted your reports to the supervisor and examiner. You must make an appointment for the oral defence.

5. Completion of your thesis

Assessment of the thesis

For the Wageningen University assessment, supervisors/examiners use the Wageningen University Thesis Assessment Form (see Appendix II). The average grade for each category (performance, thesis project report, oral presentation (colloquium), oral defence) should be at least 5.5 for a pass.

The assessment strategy below shows the relation between the learning outcomes and the different parts of the assessment.

		Assessment categories			
		Performance	Research Report	Oral presentation	Oral defence
Weights	Description				
	% of grade	40%	50%	5%	5%
Learning outcomes	1 Develop a research plan, including: a description of the research topic in relation to the wider scientific context; an identification of the knowledge gap; formulation of research questions and/or a hypothesis, aims and objectives; an explanation of how you intend to conduct the research (e.g. in terms of a design for the project, data-collection and -analysis methods, research tools).	x	x		x
	2 Collect, select and process data, using the design for the project, methods and tools described in the research plan.	x	x		x
	3 Analyse and synthesise the data in order to answer the research questions and/or test the hypothesis.	x	x	x	x
	4 Formulate answers to the research questions that are supported by the research outcomes; pay attention to potential limitations; critically discuss the outcomes in relation to the wider scientific and societal context.	x	x	x	x
	5 Report on the research, both in writing and in oral presentation.	x	x	x	
	6 Work in compliance with academic codes of conduct, and with proper management of time and resources.	x	x		
	7 Make use of input and feedback for executing the research project and provide feedback to others.	x			
Assessors	Supervisor	x	x	x	x
	Examiner*		x	x	x

* The examiner will determine the final grading after a discussion with the supervisor/second assessor.

A rubric is used for feedback and grading (see Appendix II). After the examination, you will receive the reasoning behind your thesis grade, including specific feedback on all assessment categories. The final grade is administered in OSIRIS.

Delay and possibility to resit

The start and end date of your thesis are recorded in the Learning Agreement. There are a number of potential causes for delay in your thesis project: force majeure, functional disabilities or an insufficient result for your thesis.

In case of force majeure (circumstances beyond one's control) you can discuss an adjustment to your time schedule with your supervisor. Your supervisor can register an adjusted end date in OSIRIS.

In case of functional disabilities or other valid reasons for delay that are known beforehand, those should be mentioned at the start of the course. Your supervisor will only extend the regular duration of the project based on the advice of a student dean.

If you do not manage to complete a satisfactory final report before the end date recorded in the learning agreement, you may ask your supervisor for an extension of two months. Supervisors will extend the end date if they expect that you will be able to hand in a satisfactory report within these extra months. If you are not able to hand in a satisfactory report within two extra months, your WU supervisor and examiner can decide that you should start a new thesis. This new thesis does not necessarily need to have the same supervisor, chair group or be on the same subject. If you do start a new thesis, this is still considered as a resit.

If you and your WU supervisor disagree on your being able to pass the course in two extra months, and you do not get up to two months extension for finishing your thesis, you are able to send an appeal to the Examination Appeals Board. But ask your study adviser for advice first in this case; usually there are other possibilities to solve the issue.

Feedback on your thesis

Following the assessment, Wageningen University will send you a link to an online evaluation questionnaire. Please complete this, even if your thesis project is finished. The results of the questionnaires help us to improve the quality of the thesis supervision and organisation, and to identify potential (or actual) problems. The evaluation is anonymous.

Part B: Chair group specific regulations

This section contains information about how MSc Thesis should be arranged at the BioProcess Engineering group.

Course code	MSc Thesis BPE: BPE80336 and BPE80324
Credits	24 - 39 ECTS
Weeks	16 - 28 weeks
Contact person	Giuseppe Olivieri Giuseppe.Olivieri@wur.nl tel: +31 317 483902; +31 6 18211294
Examiners	Sarah D'Adamo, Maria Barbosa, Mark Bisschops, Iulian Boboescu, Rafael Cubero, Iago Dominguez Teles, Michel Eppink, Marcel Janssen, Antoinette Kazbar, Dirk Martens, Giuseppe Olivieri, Shirley Pomponi, Arjen Rinzema, Ruud Weusthuis, Rene Wijffels
Supervision	Staff, PhD students, Postdocs BPE
Period	All

1. Introduction

The aim of the thesis at BPE is to learn how to perform academic research in the field of Bioprocess Engineering. Research means the systematic investigation of materials, processes and sources in order to establish facts and reach new conclusions. During your thesis at BPE we will teach you how to do research in a structured way. Hereby the specific learning outcomes for a Thesis carried out at BPE in addition to the general list on page 3 of this course guide:

- Analyse a biotechnological production process and/or the metabolism of a production microorganism
- Identify and analyse the bottlenecks in the process and/or the metabolic pathways involved
- Formulate a solution strategy to deal with at least one particular bottleneck
- Formulate a hypothesis for the thesis research based on previous research and literature
- Formulate a clear objective for the thesis research
- Formulate the approach to test the hypothesis
- Set-up a work plan for the research and describe the experimental work involved
- Independently carry out the research and the experimental work in a safe way
- Analyse data and translate the data into concise figures and tables
- Critically reflect on the research performed and the data obtained
- Draw clear conclusions from the results obtained
- Formulate recommendations for further research and development
- Effectively discuss research results with supervisors and other experts and co-workers in the field
- Put the research in perspective of other research going on in the bioprocess engineering field.
- Write a clear and well-structured scientific report on the performed research
- Give a clear and well-structured presentation about the thesis research
- Defend the formulated research approach and the results and conclusions obtained

2. Assumed/Prerequisite knowledge

At least 6 ECTS of BPE offered courses of the list below can give excess to an MSc Thesis under supervision of BPE:

- BPE34306 Metabolic Engineering of Industrial Microorganisms, BPE36306 Advanced Bioreactor Design, FPE31306 Transfer Processes, BCT32306 Advanced Biorefinery, BPE36806 Advanced Separation Process Design, BPE35306 Microalgae Biotechnology, BPE34806 Pharmaceutical Biotechnology or the combination of BPE33803 Animal Cell Biotechnology with BPE35803 Marine Biotechnology.

3. Before starting your thesis project

One month before you intend to start the thesis, you and your supervisor will draw up a contract (the “learning agreement form”) to determine the content of your thesis, the time schedule, the supervisors, etc. This form needs to be signed by you, your supervisors and your study advisor (your study advisor should state that you are allowed to start your thesis at BPE).

You are also asked to fill out the BPE thesis entry form and send this with a copy of the signed thesis learning agreement form to the BPE secretary Miranda Berger (Miranda.Berger@wur.nl). Based on that she will arrange a workplace, a BPE account and access to the building, etc.

The current version of the MSc Thesis Learning Agreement is available on the BPE website at <http://www.wageningenur.nl/en/Expertise-Services/Chair-groups/Agrotechnology-and-Food-Sciences/Bioprocess-Engineering/Education/BSc-and-MSc-Thesis/Guidelines.htm>

and on the general WUR website: <https://www.wur.nl/en/Education-Programmes/Student-Service-Centre/Show-ssc/Forms-Student-Service-Centre.htm>

4. Start of your thesis project

On the first day of your thesis project, your supervisor will introduce you to the chair group. The BPE secretary Miranda Berger will inform you about the organized workplace, account and access to the building.

Normally you start your project by reading literature to increase your background knowledge about the subject. Within 3-4 weeks, you will write a **research proposal** about the background and the goals of your research. After discussion and adjustment of this document and approval by your supervisor, the research proposal is distributed among all BPE group members via e-mail. Make sure to include a picture of yourself in the document.

Together with your supervisor you will decide when to start with the actual research. Before you are allowed to enter one of the BPE laboratories, you are obliged to follow a **safety lecture** and to join a **lab tour**. The safety lecture makes you aware of the risks of your activities in the lab and teaches you the rules for safety (contact Sebastian Haemers for a date for this safety lecture and for the lab tour dealing with specific safety issues).

As a thesis student at BPE, you will be assigned to a theme group within the chair group of BPE. Theme group meetings are organized by the theme leader. This will be announced by email. We expect all theme group members to attend the theme group meetings. You are furthermore asked to be present during the presentations and colloquia of all other students.

5. Oral presentations

After 3-4 weeks, you will give a short introductory presentation (10 min presentation plus 5 min for questions) to introduce your research and how you are going to deal with it. At the end of your thesis period, you will give your final presentation, the colloquium (20 min presentation plus 10 min for questions), about the final results of your thesis project. Both presentations should be scheduled on Monday afternoon or Thursday morning and announced at least one week in advance to all BPE members by e-mail.

Your presentations are always reviewed with focus on the content and the presentation technique. Moreover, these presentations are useful for feedback and tips from the audience.

6. Progress evaluation

Approximately half-way the project, the progress is evaluated by you and the supervisor(s). All aspects of the thesis project (project plan, supervision, performance) are considered. For this the progress evaluation form (which can be found online) is used. The supervisor has to register the outcome (pass or fail) in Osiris. In case of a “fail”, you will have to look for another project and start again. If progress has not been achieved as planned due to other reasons (e.g., illness, problems in supervision), the planning of the rest of the project may need to be adjusted, and new feasible end goals defined.

The progress evaluation is also a good moment to *provide* feedback to your supervisors, for example to discuss any shortcomings in your supervision and agree on improvement.

7. Assessment strategy

Your thesis will be assessed using a standard thesis assessment form and the standard qualification criteria for a thesis at the BPE department of Wageningen University will be used for the final evaluation.

These can be found at:

<http://www.wageningenur.nl/en/Expertise-Services/Chair-groups/Agrotechnology-and-Food-Sciences/Bioprocess-Engineering/Education/BSc-and-MSc-Thesis/Guidelines.htm>

or at <http://wur.eu/thesis-internship>

8. Intellectual property right and confidentiality

The intellectual property rights (IPR) of your work belong to the university. If a publication is largely based on your work, you may be involved as author of a paper. If a paper is only partly based on your work, you may be acknowledged in the paper or not, depending on the importance of your contribution. How, when and who publishes, is decided upon by the Bioprocess Engineering group. You are not allowed to make the results of the thesis public, e.g., on internet (including social media such as Facebook or LinkedIn) or by showing the report to potential employers, without prior consent of the staff or supervisor at BPE.

Appendices

Appendix I: Summary of 'The Wageningen Code of Conduct for Scientific Practice'

The Wageningen Code of Conduct for Scientific Practice concerns principles of good scientific teaching and research, containing the Netherlands Code of Conduct for Research Integrity. The main aspects described in this code concern: Scrupulousness, Reliability, Verifiability, Impartiality, and Independence. See also: [Netherlands Code of Conduct for Research Integrity](#)

Scrupulousness: Scientific activities are performed scrupulously, unaffected by mounting pressure to achieve.

- Scrupulousness is expressed through precision and nuance in providing scientific instruction, conducting scientific research and the publishing of results thereof.
- Every scientific practitioner demonstrates respect for the people and animals involved in scientific teaching and research.
- Accurate source references serve to ensure that credit is awarded where credit is deserved. This also applies to information gathered online.
- Authorship is acknowledged. Rules common to the scientific discipline are observed.
- Scrupulousness is not restricted to the transfer of information, but also applies to relations among scientific practitioners and with students.
- Good mentorship is essential: a student and junior staff member are in a position of dependency. The responsibilities of persons involved in teaching and research are clearly defined and observed at all times.
- A scientific practitioner avoids personal relationships that may give rise to reasonable doubt concerning the objectivity of their decisions, or that may result in any form of coercion or exploitation of a hierarchically subordinate person.
- The assessment of study performance is based on explicit criteria that have been announced in advance. Teachers are prepared to explain every assessment, while students are sufficiently aware of the matter on which they will be assessed.
- A scientific practitioner ensures that they maintain the level of expertise required to exercise their duties. They do not accept duties for which they lack the necessary expertise. If necessary, they actively indicate the limits of their competence
- Damages, as a result of errors or negligence, are repaired to the best of one's ability.
- A scientific practitioner is responsible for the quality of the educational programme in which they provide instruction, and for the scientific and societal value of the research programmes in which they participate. They act according to their own preferences only insofar as they are reconcilable with this responsibility.

Reliability: Science's reputation of reliability is confirmed and enhanced through the conduct of every scientific practitioner. A scientific practitioner is reliable in the performance of their research and in the reporting, and equally in the transfer of knowledge through teaching and publication.

- The selective omission of research results is reported and justified. The statistical methods employed are pertinent to the acquired data.
- Speculation, spurred by results of scientific research, is recognisably presented as such. This does not include conclusions on the basis of the presented results. Suggestions for follow-up research may rest on speculation, in the form of an interpretation of the acquired results.
- The system of peer review can only function on the assumption that intellectual property is recognised and respected.
- A scientific practitioner provides a complete and honest overview of their skills whenever a decision concerning their career or duties is pending.

- In transferring information in education, a selective representation of available knowledge is either avoided or justified. A clear distinction is made between transferred knowledge and personal opinion or related speculation.

Verifiability: Presented information is verifiable. Whenever research results are publicised, it is made clear what the data and the conclusions are based on, what they were derived from and how they can be verified.

- Research must be replicable in order to verify its accuracy. The choice of research question, the research set-up, the choice of method and the reference to sources studied is accurately documented.
- The quality of data collection, data input, data storage and data processing are guarded closely. All steps taken must be properly reported and their execution must be properly monitored (through lab journals, progress reports, documentation of arrangements and decisions, etc.).
- Raw research data is stored for at least five years. This data is made available to other scientific practitioners on request.
- Raw research data is archived in such a way that it can be consulted with minimal expense of time and effort.
- The source of all educational material, including oral information transfer, is stated.

Impartiality: In their scientific activities, the scientific practitioner needs no other interest than the scientific interest. In this respect, they are always prepared to account for their actions.

- Scientific practitioners give others room to take their own intellectual stance. This applies particularly in case of a hierarchical relation, like the relation between a teacher and a student, or a tutor and a PhD student.
- The choice of methods and criteria is guided solely by the goal of truth-finding, and not by external goals, such as commercial success or political influence.
- A reviewer consults their conscience as to whether they can offer an impartial assessment of a manuscript, for instance when it concerns a competing research group.
- In assessing the performance of others (e.g. peer review in education, research and manuscripts), a scientific practitioner heeds arguments of scientific substance. They refrain from assessing a manuscript if they are in any way involved in the education or research concerned.
- A scientific practitioner only defends a certain scientific viewpoint if that viewpoint is based on sufficient scientific grounds. Competing viewpoints must be mentioned and explained.
- Exclusively assigning one's own study books in education is avoided, in any case at undergraduate level.
- In its annual report, every university reports on its registration of side activities by its staff. Every university registers the side activities relevant to scientific practice. Preferably, this register is made publicly accessible.
- Every scientific practitioner allied with a university provides their institution with an up-to-date overview of their side activities for registration purposes.

Independence: Scientific practitioners operate in the context of academic liberty and independence. Insofar as restrictions of that liberty are inevitable, these are clearly stated.

- Whenever a scientific practitioner is commissioned to provide instruction or conduct research, they are allowed – once the parameters have been defined – to execute the assignment without interference from the commissioning party. The research question is of interest to science, aside from the commissioning party's particular concern. The method employed is scientifically valid. The commissioning party has no influence on the research results.
- Commissioned assignments demonstrably contribute to scientific teaching or research.
- There is no ambiguity as to the identity of the commissioning party of the scientific activity, the relation between the commissioning party and the executing party, the existence of consultancy relations or other connections, etc.

- The publication of scientific research results is guaranteed. Arrangements with external financiers always stipulate that the scientific practitioner is at liberty to publish the results within a specified, reasonable period.
- External financiers of executed projects are identified by name. For research, this means that their names are stated in the publication; for education, this means that they are referred to in the course announcement and teaching material.

Appendix II: Downloads

- **Wageningen University MSc Thesis Learning Agreement**

The current version of the MSc Thesis Learning Agreement is available on the WUR website:

<https://www.wur.nl/en/Education-Programmes/Student-Service-Centre/Show-ssc/Forms-Student-Service-Centre.htm>

- **Assessment form and rubric**

The WU thesis assessment form and rubric will be used to grade your thesis after completion. We encourage you to look at the assessment criteria at the start of your project. You can download the most recent version of the assessment form and rubric from the Education & Student Affairs

SharePoint site:

<http://wur.eu/thesis-internship>