university of groningen

Appendices for the Master's degree programme(s) in Ecology and Evolution

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Appendix I. Learning outcomes of the degree programme (art. 3.1)

After completion of the master's degree programme, the graduate:

1. a) has acquired in depth knowledge on one or more scientific disciplines within the field of Ecology and Evolution, and can use this knowledge to explain in detail the relevant concepts, using the appropriate terminology;
   b) has acquired cross disciplinary knowledge of issues across scientific disciplines within the field of Ecology and Evolution and can use this knowledge to explain current societal and scientific challenges;
2. can design, and conduct scientific research, and systematically organize their work in scientific research;
3. can independently investigate, and critically evaluate scientific literature;
4. can identify new developments in the related disciplines, and can become familiar with these developments;
5. can formulate realistic, and original solutions to complex problems;
6. can participate in, and contribute to a multidisciplinary team;
7. can effectively communicate acquired knowledge, insights and skills to others, both in writing, and in oral presentation;
8. can identify societal and ethical implications of scientific research, and is able to critically reflect on their actions in this context;
9. can independently acquire new knowledge, and skills that are relevant for their professional career, in science, in policy & management or society.

Track-specific learning outcomes

After completion of the track Ecology and Conservation, the graduate:

1. can contribute to the development of new knowledge and to solving current ecological problems and future challenges
2. can apply relevant eco-evolutionary theories and methods to current pertinent issues in nature conservation
3. can analyse the functioning and stability of natural communities in the wild by integrating theory and ecological research
4. can communicate research and philosophies of ecology and conservation at a professional level to a scientific audience

Track-specific learning outcomes

After completion of the track Evolutionary Biology, the graduate:

1. can contribute to the development of new knowledge and to elucidating evolutionary processes
2. can apply central concepts of evolutionary theory in various research contexts, including empirical research and theoretical modelling
3. can analyse population or individual-based genetic and genomic data to address research questions in conservation genetics, evolutionary ecology, development and behaviour
4. can communicate eco-evolutionary principles, theory and research at a professional level to a scientific audience

Appendix II. Tracks/specializations (art. 3.6)

1. Within the degree programme Ecology & Evolution, students can follow the track Ecology & Conservation.
2. Within the degree programme Ecology & Evolution, students can follow the track Evolutionary Biology.

Appendix III. Content of the degree programme (art. 3.8)

Track Ecology and Conservation:

Study elements	Course code	ECTS	Entry requirements
*Ecological Research Skills **	WMEV005-10	10	
Conservation Ecology Practices	WMEV004-05	5	
Advanced Population & Community Ecology	WMEV008-05	5	
Research project** (RP)	WMEV90x-xx	40	see appendix V
Research project** (RP)	WMEV90x-xx	30	see appendix V
Colloquium	WMEV001-05	5	RP
Electives***		≤25	see Ocasys

Track Evolutionary Biology:

Study elements	Course code	ECTS	Entry requirements
*Behaviour, Ecology & Evolution **	WMEV003-10	10	
Evolutionary Theory	WMEV006-05	5	
Principles of Population Genetics in Natural Populations	WMMB005-05	5	
Genomics in Ecology and Evolution	WMEV011-05	5	
Research project** (RP)	WMEV90x-xx	40	see appendix V
Research project** (RP)	WMEV90x-xx	30	see appendix V
Colloquium	WMEV001-05	5	RP
Electives***		≤20	see Ocasys

In addition to the above scheme the following rules apply:

- The student chooses a mentor from the list of mentors in Ecology & Evolution to get advice on and discuss the contents of the individual degree programme before requesting approval from the Board of Examiners.

- * Because of overlap between *Behaviour, Ecology & Evolution* and *Ecological Research Skills*, students are allowed to have only one of these courses in their master study programme of 120 ECTS.

- ** The first research project (preferably the 40 EC) must be an internal project. Internal projects must be performed at the FSE (within Life Sciences-oriented research groups) or the Netherlands Institute for Sea Research under supervision of one of the examiners of the degree programme.

- *** The student may choose from the onset to use 10ECTS to extend a research project, prepare a manuscript related to a master research project (no more than 10 ECTS, the assessment will be Pass or Fail), attend master courses (appendix IV), include a maximum of 10 ECTS of courses from other relevant Life Sciences programmes, and/or repair specific deficiencies or perform a research assignment of 5,10,15 or 20 ECTS.

- Research projects and colloquium must deal with different subjects, and be approved of by the Board of Examiners.

- Research projects 1 and 2 must be supervised by a different first examiner. In addition, it is advisable that research projects and colloquium all are supervised by different examiners.

- The course unit Laboratory Animal Science is mandatory for students planning to participate in an “animal experiment” as defined by law (directive 2010/63/EU) during their research project work.

Appendix IV. Electives (art. 3.9.1)

The following lists present study elements that can be chosen as 'electives'. After consultation with the study mentor, and approval of the Board of Examiners (through an individual request) students may also choose from options available from other programmes, other universities in the Netherlands or abroad.

Electives organised by the research institutes GELIFES and ESRIG:

Course	Course code	ECTS
Advanced Population & Community Ecology	WMEV008-05	5
Advanced statistics	WMBY018-06	6
Behaviour, Ecology & Evolution#	WMEV003-10	10
Modelling Complex Biological Systems	WMBY027-05	5
Conservation Ecology Practices	WMEV004-05	5
Ecology of Sustainable Farming *(biennial, runs in 2025/2026)*	WMEV009-05	5
Evolutionary Medicine: Infectious Diseases	WMBY024-05	5
Evolutionary Medicine: Diseases of Affluence	WMBY025-05	5
Evolutionary Theory	WMEV006-05	5
Flyway Ecology	WMEV010-05	5
Genomics in Ecology and Evolution	WMEV011-05	5
ISCOMS conference	WMBM029-01	1
Island Biology	WMEV016-05	5
Laboratory Animal Science*	WMBY026-05	5
Mathematical Models in Ecology and Evolution	WMEV013-06	6
Mathematical Models in Biology	WMBY031-05	5
Marine Ecosystem Service & Global Change	WMMB008-05	5
Marine Conservation	WMMB011-05	5
Microbiological Safety	WMMP004-01	1
Microbiome in Ecosystem Health	WMBY033-05	5
Molecular Methods in Ecology & Evolution	WMEV007-05	5
Orientation on Non-academic Careers	WMBY032-05	5
Practical Computing for Biologists	WMBY008-05	5
Practical Modelling for Biologists	WMBY009-05	5
Principles of Biological Oceanography**	WMMB003-05	5
Principles of Marine Biology**	WMMB004-05	5
Principles of Population Genetics in Natural Populations**	WMMB005-05	5
Programming in C++ for Biologists ***	WMBY010-05	5
Polar Ecosystems	WMMB009-05	5
Research Proposal Ecology and Evolution	WMEV012-05	5

* Course unit only possible in combination with an MSc research project involving animals.
** Students MSc Marine Biology have priority in enrolment
*** Students who have already followed similar courses during their bachelor's degree will be given a deepening version of the course more tailored to their individual background knowledge and skills.

Electives organised by the research institute GBB:

Course	Course code	ECTS
Advanced Light Microscopy	WMBY016-05	5
Advanced Genetic Engineering and Complex Gene Regulatory Circuitries*	WMBS006-05	5
Advanced Biocatalysis	WMCH033-05	5
iGEM (International Genetically Engineered Machine competition)** (biennial, runs in 2026-2027)	WMBS013-xx	≤20
Next-generation sequencing methods and data analysis *	WMBS023-05	5
Tools and Approaches of Systems Biology*	WMBS005-05	5

* Students MSc Biomolecular Sciences have priority in enrolment** Selection for this biennial course takes place in wintertime, an advertisement about application details is announced via Brightspace and other means during the academic year.

Elective organised by Royal Netherlands Institute of Sea Research:

Course	ECTS
NIOZ Marine Masters' Summer Course	4

Elective organised by Tropical Biology Association:

Course	ECTS
TBAs Masters' Summer Field Course	5

Electives organised by Science & Society:

Course	Course code	ECTS
Introduction Science & Business	WMSE001-10	10
Introduction Science & Policy	WMSE002-10	10

Electives organised by Energy and Environmental sciences*:

Course	Course code	ECTS
Energy, Atmosphere and Resources	WMEE028-05	5
Ecology and Ecosystem Sustainability	WMEE021-05	5
Sustainable Society	WMEE020-05	5
Modelling Energy Systems	WMEE025-05	5

*Students MSc Energy and Environmental Sciences have priority in enrolment

Electives organised by Education and Communication*:

Course	Course code	ECTS
Research Methods in Science Education and Communication	WMEC005-05	5
Skills in Science Communication (2a only)	WMEC006-05	5

* Students MSc Science Education and Communication have priority in enrolment

Elective master courses organised by Teacher Education**

Course	Course code	ECTS
Neem Regie	TEM0110-24	10

** Dutch-speaking students only

Electives organised by The Donald Smits Center for Information Technology:

Course (max 2 ects per individual programme^)	½ day unit^
Access basic	5
Excel basic	3
Excel advanced	5

^ A minimum of 5 half-day units is required for a study load of 1 ECTS, for 2 ECTS 11 units are needed.

These courses have additional costs (at a low fee for students), which are at the student's own expenses. These courses are not available in Ocasys. Please consult the Donald Smits Center for further information, time schedules and enrolment details.

Appendix V. Entry requirements and compulsory order (art. 4.4)

Course unit	Entry requirement
Colloquium	Research project 1
Research project 2	Research project 1

Appendix VI. Admission to the degree programme (art. 2.1A.1 + 2.1B.1)

1. Requirements for admission to the selective master's degree in Ecology and Evolution

Applicants have to fulfil the following admission requirements:

- an academic Bachelor's degree in Biology with a specialization in Ecology and Evolution or Marine Biology
- sufficient English proficiency; see https://www.rug.nl/fse/programme/admissions/msc/language-requirements

2. Applications procedure for selective master degree programmes:

All candidates have to register in Studielink before the application deadline, and submit the following documents (start academic year 1 September):

- ID card or passport
- Diploma of relevant Bachelor's degree programme (if possible)
- List of grades (transcript of records)
- Proof of English language proficiency
- CV
- Checklist:

Motivation
Reference contacts/letters
List of subjects/courses (to be) followed
Brief description of 5 key subjects/courses (*bachelor students Biology at the University of Groningen with a major in Ecology and Evolution do not need to give this description)

- A report as a result of an academic assignment in the context of the programme. The report has to reflect the student's ability to produce a well-structured and concise report.

After candidates have completed their registration in Studielink, applications will be processed in the following way:

For holders of a Dutch BSc diploma:

1. Admission Support FSE compiles the individual selection file
2. Admission Support FSE submits the individual selection file to the Admissions Board of the individual programme

For holders of a non-Dutch BSc diploma:

1. Admissions Office compiles the individual selection file
2. Admissions Office validates individual Bachelor's degree diploma

3. Admissions Office submits the individual selection file to the Admission Support FSE
4. Admission Support FSE submits the individual selection file to the Admission Board of the individual programme

3 Selection procedure

In order to select the appropriately suited and motivated students, the Admission Board requires a complete selection file from all candidates. The Admission Board of the individual programmes will review all individual applicants on the basis of their selection file. All candidates that have an appropriate background will be considered admissible and further considered for the selection procedure described below. All candidates who meet the selection criteria regarding 'academic performance' and 'motivation' (as specified by the different programmes) will be admitted to the ranking list.

At least two members of the Admission Board score the selection criteria. Scoring is on a 9-point scale from 1 to 5 (1 = insufficient to 5 = excellent with 0.5 steps). If the scores on academic performance and/or motivation deviate 1 point or more, the members of the Admission Board that gave the scores have to confer, after which they grade a second time. This outcome constitutes the final score. Candidates with minimally a sufficient average score of 3 for each criterion, and an average overall score of at least 3.5 are selected.

- **Academic performance (60%)**

The score on academic performance is the average result of the scores on relevance (70%) and proficiency (30%). Maximum score 1 point per key subject for criterium on relevance and maximum 5 points for criterium on proficiency.

A) Relevance and affiliation/fit (70%) of the followed Bachelor programme to the Master programme (list of subjects/courses followed and grades obtained; brief description of the content of 5 key subjects/courses demonstrating the programme specific knowledge and skill(s) acquired by the student).

Key subjects[1]:

1. Biostatistics (Biostatistics 1, Biostatistics 2, Research Skills in Ecology & Evolution 1+2)
2. Evolution (Evolutionary Ecology, Genes & Evolution, Genetics Ecology & Evolution, Research Skills in Ecology & Evolution 1+2)
3. Ecology (Behavioural Neuroscience, Evolutionary Ecology, Research Skills in Ecology & Evolution 1+2, Systems Ecology & Ecological Interactions)
4. Physiology (Physiology, Ecophysiology of Plants & Animals)
5. Cell biology (Basic Cell & Molecular Biology, Genetics Ecology & Evolution, Biochemistry & Cell Biology in Ecology & Evolution)

[1] *Key subjects/courses: the nature of the knowledge and relevant skill(s) are defined by the deputy director in consultation with the programme committee, and are approved by the director of the Graduate School.*

Please consult our online catalogue www.rug.nl/ocasys/ for the intended learning outcomes of the course units that cover these subjects

B) Academic and analytical skills/Proficiency (30%) in completing an academic assignment in the context of the programme, and in individually producing a written report on the assignment topic. The report has to reflect the student's ability to produce a well-structured and concise report. It also has to show that the student is developing a critical attitude, and is capable of critical thinking. The assignment handed in is free of choice, and can be a report on a practicum, experiment, field-work, a literature review, a bachelor thesis, etc.[2])

[2] *If the student has not made an individually written report in English during the bachelor programme he/she should contact Admission Support FSE to receive an assignment on the basis of which a written report can be prepared.*

1. Motivation (40%)
The candidate has to provide a motivation form (max. 500 words, part of the checklist) demonstrating a suitable stance and talent to follow the programme. Maximum score 1 point (1 point for excellent, 0,5 point for satisfying) per question/issue 1-5. In case a specific motivation is covered under question/issue 6, the BoA members will together discuss the scoring of this answer, and note this in the scoring sheet. The motivation table in the checklist should address the following specific questions/issues:

1. Why did you choose this specific master's degree programme?

2. How did the bachelor's degree programme, extracurricular activities, and/or other experiences prepare you for this specific master programme?

3. In case it took you longer than nominal to acquire the bachelor degree, please briefly explain the cause(s) of the delay.

4. How does this master' degree programme prepare you for your future career and/or serves your ambitions?

5. The master program contains two research projects of 5-7 months. On what topic and under supervision of which researcher(s) at the University of Groningen would you like to carry out your first project? Please motivate your choices?

6. Free space to mention anything you feel is relevant and is not addressed by the questions above.

Timeline for the application and selection procedure
The application procedure for the start on the 1st of September will open on the 1st of October and will close on the 1st of May. The details of the entire application procedure are published on the *Admission and Application* website for the individual Master's degree programme.

After registration in Studielink, all candidates will receive an email with an overview of the application procedure, the deadlines and instructions on how to proceed.

After candidates have successfully submitted all necessary documents, Admission Support FSE (for holders of a Dutch BSc diploma,) or the Admissions Office (for holders of a non-Dutch BSc diploma) will send the candidate a confirmation of receipt.

Candidates with minimally a sufficient average score of 3 for each criterion, and an average overall score of at least 3.5 are selected and will be offered a place in the programme.

Candidates who are not selected can lodge a written appeal against this decision within four weeks of the date of sending, with the Board of Appeal for Examinations, P.O. Box 72, 9700 AB Groningen, the Netherlands.

Appendix VII. Pre-master programmes

1. FSE offers Pre-Master's programmes for access to the MSc Ecology and Evolution and individually determined Pre-Master's programmes. The overview below shows:
   - which NVAO-accredited HBO diploma grants access to the MSc Ecology and Evolution:
   - The content and student workload for these fixed programmes.

   a. The following types of HBO qualification qualifies for participation in the selection procedure:
      - (Applied) Biology (CROHO 30009)
      - Environmental Management (CROHO 34859)
      - Animal Management (CROHO 34333)

The Pre-master's programme of 35 ECTS comprises the following course units* (more detailed descriptions of the course units can be found on Ocasys):

- Systems Ecology & Ecological Interactions I (period 1a), 5 ECTS
- Systems Ecology & Ecological Interactions II (period 1a), 5 ECTS
- Genes and Evolution (period 1a), 5 ECTS
- Conservation Biology (period 1B), 5 ECTS
- Biostatistics II (period 2a), 5 ECTS
- Evolutionary Ecology (period 2a), 5 ECTS
- Bachelor Thesis (whole year), 5 ECTS

Starting date(s): 1 September

2. For HBO programmes not listed above, the Board of Admissions decides:
   a. The content and the student workload of a tailormade Pre-Master's programme.

or

   b. Admission is not accepted.

3. For selective masters, pre-master's students are selected on the basis of the following selection criteria and selection procedure:
   a. the Pre-master's programme is intended for students at a University of Applied Sciences who are performing above average: the Admissions Board assesses students on the strength of the knowledge/major and skills they have already acquired and motivation. As part of the selection procedure, the Admissions Board therefor requests a nomination letter from the HBO programme.
   b. a completed premaster in Ecology and Evolution also gives access to the MSc Biology.

* subject to availability

Appendix VIII. Transitional provisions (art. 7.1)

The essay, WMEE002-05 can be listed as elective if a result has already been achieved in previous academic years before termination of this individual item.

Obligatory MSc Biology courses Skills for Biology 1: Professional Perspectives and Career Orientation (WMBY029-05) and Skills for Biology 2: Quantitative Research Methods (WMBY028-05) can be listed as electives if a result has already been achieved before transferring to the selective MSc Ecology and Evolution.

Appendix IX. Additional Requirements Open degree Programmes (art. 3.10)

In exceptional circumstances students wishing to pursue an open degree programme may file a request with the Board of Examiners. The Board of Examiners will evaluate whether the proposed curriculum meets the learning outcomes of the degree programme and can determine further conditions in their rules and regulations.