Appendices to the Teaching and Examination Regulations 2021-2022

Appendix I. Learning outcomes of the degree programme Ecology & Evolution* (art. 1.3)

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 his/her 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 his/her actions in this context;
9. can independently acquire new knowledge, and skills that are relevant for his/her 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 analyze 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 analyze population or individual-based genetic and genomic data to address research questions in conservation genetics, evolutionary ecology, development and behavior
4. can communicate eco-evolutionary principles, theory and research at a professional level to a scientific audience

* These are based on the taxonomy of Bloom

Appendix II. Tracks/Specializations of the degree programmes (art. 2.2)

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.
3. Within the degree programme Ecology & Evolution, students selected for the mobility programme MEME follow the track Evolutionary Biology. For this mobility programme, specified Teaching and Examination Regulations and admission rules apply.

Appendix III. Content of the degree programme (art. 2.3)

Track Evolutionary Biology:

Study elements	**ECTS**	**Entry requirements**
Behaviour, Ecology & Evolution *	9	
Evolutionary Theory	8	
Principles of Population Genetics in Natural Populations	5	
Genomics in Ecology and Evolution	5	
Essay [@]	5	
Research project** (RP)	40[@] or ≥	see appendix V
Research project** (RP)	30 or ≥	see appendix V
Colloquium	5	*RP or @Behaviour, Ecology & Evolution* and *Evolutionary Theory*
Electives***	≤15	see Ocasys

@ For students in the Mobility Programme MEME, the essay is a literature study written in the form of a research proposal during the course Research Proposal in Ecology and Evolution and both research projects are 30 ECTS

Track Ecology and Conservation:

Study elements	**ECTS**	**Entry requirements**
Ecological Research Skills *	10	
Advanced Population & Community Ecology	5	
Conservation Ecology Practices	5	
Research project** (RP)	40 or ≥	see appendix V
Research project** (RP)	30 or ≥	see appendix V
Colloquium	5	RP
Essay	5	-
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 one ≥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 to use 5,10,15 or 20 ECTS 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. During the mid-term assessment one may extend the research project with only 5 or 10 ECTS.

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

- The course unit Animal Experimentation 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. 2.4)

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 (use the proposal form) students may also choose from options available from other programmes, other universities in the Netherlands or even abroad.

Electives organised by the research institutes GELIFES and ESRIG:

Course	**ECTS**
Advanced self-organisation of social systems	5
Advanced Imaging techniques	5
Advanced Population & Community Ecology	5
Advanced statistics	6
Animal Experimentation*	5
Biological Modelling and Model Analysis	10
Conservation Ecology Practices	5
Ecology of Sustainable Farming (biennial, runs in 2021/2022)	5
Evolutionary Medicine: Infectious Diseases	5
Evolutionary Medicine: Diseases of Affluence	5
Evolutionary Theory	8
Flyway Ecology *(biennial, does not runs in 2021/2022)*	5
Genomics in Ecology and Evolution	8
Mathematical Models in Ecology and Evolution	6
Mathematics in the Life Sciences	5
Marine Ecosystem Service & Global Change	5
Marine Conservation	5
Meta-analyses in Ecology (*biennial, does not run in 2021/2022)*	5
Molecular Methods in Ecology & Evolution *(biennial, runs in 2021/2022)*	5/10
Orientation on International Careers	5
Practical Bioinformatics for Biologists	5
Practical Modelling for Biologists	5
Principles of Biological Oceanography**	5
Principles of Marine Biology**	5
Principles of Population Genetics in Natural Populations**	5
Programming in C^{++} for Biologists ***	5/10
Polar Ecosystems	5
Research Proposal Ecology and Evolution	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 courses organised by the research institute GBB:

Course	ECTS
Advanced Light Microscopy	5
Advanced Genetic Engineering and Complex Gene Regulatory Circuitries*	5
Biocatalysis & Green Chemistry	5
Radioisotopes in Experimental Biology	5
Tools and Approaches of Systems Biology*	5
Transcriptomics: DNA microarrays and RNAseq*	5

* Students MSc Biomolecular Sciences have priority in enrolment

Electives organised by Biomedical Sciences/GELIFES*:

Course	ECTS
Microbiological Safety	1
Microbiome & Health	5
Molecular Biology of Ageing and Age-related Diseases	5
Neurobiology of Nutrition	5
Neurodegenerative Diseases	5
Nutrition, Brain Development and Cognition	5
Scientific writing	5

* Students MSc Biomedical Sciences have priority in enrolment

Electives organised by Science & Society:

Course	ECTS
Introduction Science & Business	10
Introduction Science & Policy	10

Electives organised by Energy and Environmental sciences:

Course	ECTS
Impacts of Energy and Material Systems	5
Sustainable Use of Ecosystems	5
Sustainability & Society	5
Systems Integration and Sustainability	5

Students MSc Energy and Environmental Sciences have priority in enrolment

Electives organised by Education and Communication*:

Course	ECTS
Research Methods in Science Education and Communication	5
Skills in Science Communication (2a only)	5

* Students MSc Science Education and Communication have priority in enrolment

Elective master courses organised by Teacher Education**

Course	ECTS
Basiscursus Master Lerarenopleiding	5
Masterstage 1	5

** 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.

Elective master course organised by the centre for Synthetic Biology:

Course	**ECTS**
iGEM (International Genetically Engineered Machine competition)*	≤20

* Selection for this course takes place in wintertime, an advertisement about application details is announced via Nestor and other means during the academic year.

Appendix V. Compulsory order of examinations (art 3.4)

Course unit	**Entry requirement**
Colloquium	Research project 1, or *Behaviour, Ecology & Evolution,* and *Evolutionary Theory* for students in the MEME programme
Research project 2	Research project 1
Biological Modelling & Model Analysis	Mathematics in the Life Sciences or equivalent

Appendix VI. Admission to the degree programmes 2021/2022

(art. 5.1 + art. 5.2)

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

Score → Test	Overall	Reading	Listening	Speaking	Writing
IELTS (academic)	6.5	6.5	6.5	6.5	6.5
TOEFL IBT (internet-based)	90	21 * (19-23)	21 * (20-23)	21* (20-22)	24 (24-26)
Cambridge English	CAE or CPE Certificate with a minimum score of 180				
English language test - TC		B2	B2	B2	C1

This requirement is also fulfilled in case the applicant:

- is a native speaker, and completed secondary education in any one of the following countries: Australia, Canada, Ireland, New Zealand, UK or USA;
- has completed a full time bachelor's degree programme (nominal duration of at least three years) in one of the following countries: Australia, Canada, Ireland, New Zealand, UK or USA;
- has an International Baccalaureate;
- has a European Baccalaureate diploma.

2. Applications procedure (art. 4.2)

All candidates have to register in Studielink, and upload the following documents before 1 May (start 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
- Motivation form (max 500 words):
- List of subjects/courses (to be) followed
- Brief description of 5 key subjects/courses* (max 3 sentences per subject), *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. It also has to show that the student is in principle 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. If the student has not made an individually written report during the bachelor programme they should contact the selection committee to receive an assignment on the basis of which a written report can be prepared.

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

For holders of a Dutch BSc diploma:

1. The Student Administration FSE (SA FSE) compiles the individual selection file
2. SA 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 SA FSE
4. SA FSE submits the individual selection file to the Admission Board of the individual programme

3 Selection procedure

In order to select the best 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 who meet the selection criteria 'academic performance' and 'motivation' (as specified by the different programmes) will be admitted to the ranking list. The maximum number of students who will be admitted to the programme is 50.

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). If the scores on academic performance and/or motivation deviate 1 point or more, the members of the Admissions 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.

1. Academic performance (60%)

The score on academic performance is the result of the scores on relevance (70%), and proficiency (30%).

- **Relevance and affiliation/fit** 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 knowledge and skill(s) acquired by the student).

Key subjects[1]:

- Biostatistics (Biostatistics 1, Biostatistics 2, Research Skills in Ecology & Evolution 1+2)
- Evolution (Evolutionary Ecology, Genes & Evolution, Genetics Ecology & Evolution, Research Skills in Ecology & Evolution 1+2)
- Ecology (Behavioural Neuroscience, Evolutionary Ecology, Research Skills in Ecology & Evolution 1+2, Systems Ecology & Ecological Interactions)
- Physiology (Physiology, Ecophysiology of Plants & Animals)
- Cell biology (Basic Cell & Molecular Biolgoy, Genetics Ecology & Evolution, Biochemistry & Cell Biology in Ecology & Evolution)
  Please consult our on line catalogue www.rug.nl/ocasys/ for the intended learning outcomes of the course units that adhere to these subjects:

[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.*

- **Proficiency** 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 during the bachelor programme he/she should contact the selection committee to receive an assignment on the basis of which a written report can be prepared.*

2. Motivation (40%)

The candidate has to provide a motivation letter (500 words) demonstrating a suitable stance and talent to follow the programme. The letter 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 2021 will open on the 1st of October 2020 and will close on the 1st of May 2021. 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, the Student Administration 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.

The Admission Board will carry out the ranking. The top 50 students will be offered placements between the 15th of May and the 8th of June. The Admission Board can offer a maximum of 3 early admission placements to excellent students between the 1st of October and the 1st of May.

Students who are offered a place have to accept or decline the placement within four weeks after receiving the offer. If the student does not accept the placement within four weeks, this placement expires and the placement will be offered to a candidate on the waiting list. If a student declines their placement, that placement will be offered to a candidate on the waiting list.
There will be one round of offering placements to candidates on the waiting list.

Candidates who are not selected or not in the top 50 of the ranking 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 Transitional provisions (art. 7.1)
Non-applicable

Appendix VIII Additional Requirements Open degree Programmes (Art. 5.6)
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.

Appendix IX

Application and decision deadlines for admission
(art. 2.6.1 and 2.6.3)

Programmes starting on 1 September 2021

Programme	**Deadline of Application**	**Deadline of decision**
Behavioural and Cognitive Neurosciences	1 May 2021	1 June 2021
Biology	1 May 2021	1 June 2021
Biomedical Engineering	1 May 2021	1 June 2021
Biomedical Sciences	1 May 2021	1 June 2021
Biomolecular Sciences	1 May 2021	1 June 2021
Ecology and Evolution	1 May 2021	1 June 2021

Energy and Environmental Sciences	1 May 2021	1 June 2021
Human-Machine Communication	1 May 2021	1 June 2021
Marine Biology	1 May 2021	1 June 2021
Mechanical Engineering	1 May 2021	1 June 2021
Medical Pharmaceutical Sciences	1 May 2021	1 June 2021
Nanoscience: for non-EU/EEA students	1 February 2021	1 June 2021
Nanoscience: for EU/EEA students	1 May 2021	1 June 2021
Science Education and Communication	1 May 2021	1 June 2021

Programmes starting on 1 September 2021 and 1 February 2022

Programme	**Deadline of Application for 1 September**	**Deadline of decision for 1 September**	**Deadline of Application for 1 February**	**Deadline of decision for 1 February**
Applied Mathematics	1 May 2021	1 June 2021	15 October 2021	15 November 2021
Applied Physics	1 May 2021	1 June 2021	15 October 2021	15 November 2021
Artificial Intelligence	1 May 2021	1 June 2021	15 October 2021	15 November 2021
Astronomy	1 May 2021	1 June 2021	15 October 2021	15 November 2021
Chemical Engineering	1 May 2021	1 June 2021	15 October 2021	15 November 2021
Chemistry	1 May 2021	1 June 2021	15 October 2021	15 November 2021
Computing Science	1 May 2021	1 June 2021	15 October 2021	15 November 2021
Farmacie	1 May 2021	1 June 2021	15 October 2021	15 November 2021
Industrial Engineering and Management	1 May 2021	1 June 2021	15 October 2021	15 November 2021
Mathematics	1 May 2021	1 June 2021	15 October 2021	15 November 2021
Physics	1 May 2021	1 June 2021	15 October 2021	15 November 2021