

## Appendices to the Teaching and Examination Regulations 2019-2020

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

The graduate:

1. 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;
2. can design, and conduct scientific research;
3. can independently investigate, and critically evaluate scientific literature;
4. can identify new developments in the relevant disciplines, and can become familiar with these developments;
5. can systematically organize his/her work in scientific research, and 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.

\* 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:**

<b>Study elements</b>	<b>ECTS</b>	<b>Entry requirements</b>
<i>Behaviour, Ecology &amp; Evolution</i>	9	
<i>Evolutionary Theory</i>	8	
<i>Genomics in Ecology and Evolution</i>	8	
<i>Essay</i> @	5	
Research project* (RP)	40@ or ≥	see appendix V
Research project* (RP)	30 or ≥	see appendix V
Colloquium	5	<i>Behaviour, Ecology &amp; Evolution and Evolutionary Theory</i>
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:**

<b>Study elements</b>	<b>ECTS</b>	<b>Entry requirements</b>
<i>Ecological Research Skills</i>	10	
<i>Advanced Population &amp; Community Ecology</i>	5	
<i>Conservation Ecology Practices</i>	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 and discuss the contents of the individual degree programme before approval of the Board of Examiners.
- \* 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), to include a maximum of 10 ECTS of courses from other relevant Life Sciences programmes, to 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.

## 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 departments, other universities in the Netherlands or even abroad.

In the tables the column on the right indicates the master's programmes for which the courses were developed in particular:

B = Biology

EE = Ecology and Evolution

MB = Marine Biology

BiMoS = Biomolecular Sciences

### Electives organised by the research institutes GELIFES and ESRIG:

Course	ECTS	Programmes
Advanced self-organisation of social systems	5	B, EE, MB
Advanced Imaging techniques	5	B, BiMoS
Advanced Population & Community Ecology	5	- EE-
Advanced statistics	6	B, EE, MB, BiMoS
Animal and Human Experimentation: Design, Practice and Ethics	5	B, EE, MB, BiMoS
Behaviour, Ecology & Evolution	9	EE
Biological Modelling and Model Analysis	10	B, EE, MB, BiMoS
Conservation Ecology Practices	5	EE
Current Themes Seminar Series	2	B, EE, MB
Ecological Research Skills	10	EE
Ecology of Sustainable Farming	5	
Ecosystems Mediterranean Rocky Shores (not in 2019-2020)*	10	MB
Evolutionary Ecology of Marine Organisms	5	B, EE, MB
Evolutionary Theory	8	EE
Flyway Ecology (not in 2019-2020)	5	B, EE, MB
GELIFES lectures	2	B, EE, MB
Genomics in Ecology and Evolution	8	EE
Mathematical Models in Ecology and Evolution	6	B, EE, MB
Mathematics in the Life Sciences	5	B, EE, MB, BiMoS
Marine Ecosystem Service & Global Change	5	B, EE, MB
Meta-analyses in Ecology (not in 2019-2020)	5	B, EE, MB
Molecular Methods in Ecology & Evolution	5/10	B, EE, MB
Orientation on International Careers	5	B, EE, MB, BiMoS
Practical Bioinformatics for Biologists	5	B, EE, MB, BiMoS
Practical Modelling for Biologists	5	B, EE, MB
Principles of Biological Oceanography*	5	EE, MB
Principles of Marine Biology*	5	EE, MB
Principles of Marine Conservation*	5	EE, MB
Principles of Population Genetics in Natural Populations*		
Programming in C++ for Biologists	5/10	B, BN, EE, MB, BiMoS
Polar Ecosystems	5	B, EE, MB
Research Proposal Ecology and Evolution	5	EE, MB

\* Students MB have priority in enrolment

**Electives courses organised by the research institute GBB:**

Course	ECTS	Programmes
Advanced Light Microscopy	5	B, EE, MB, BiMoS
Advanced Genetic Engineering and Complex Gene Regulatory Circuitries*	5	B, EE, BiMoS
Biocatalysis & Green Chemistry	5	B, BiMoS
Radioisotopes in Experimental Biology	5	B, EE, MB, BiMoS
Tools and Approaches of Systems Biology*	5	B, EE, BiMoS

\* Students BiMoS have priority in enrolment

**Electives organised by Biomedical Sciences/GELIFES\*:**

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

\* Students BMS have priority in enrolment

**Electives organised by Science & Society:**

Course	ECTS	Programmes
Science & Business	10	B, EE, MB, BiMoS
Science & Policy	10	B, EE, MB, BiMoS

**Electives organised by Energy and Environmental sciences:**

Course	ECTS	Programmes
Impacts of Energy and Material Systems	5	B, EE, BiMoS
Sustainable Use of Ecosystems	5	B, EE, BiMoS
Sustainability & Society	5	B, EE, BiMoS
Systems Integration and Sustainability	5	B, EE, BiMoS

Students EES have priority in enrolment

**Electives organised by Education and Communication<sup>a</sup>:**

Course	ECTS	Programmes
History and Philosophy of Science	5	B, EE, MB, BiMoS
Research Methods in Science Education and Communication	5	B, EE, MB, BiMoS
Nature of Scientific Disciplines	5	B, EE, MB, BiMoS
Science Education and Communication Design	10	B, EE, MB, BiMoS
<u>Design for Science Education and Communication</u>	5	B, EE, MB, BiMoS
<u>Skills in Science Communication</u>	5	B, EE, MB, BiMoS
Science and the Public	5	B, EE, MB, BiMoS
Science Communication and Journalism	5	B, EE, MB, BiMoS

**Electives organised by The Donald Smits Center for Information Technology:**

<b>Course (max 2 ects per individual programme^)</b>	<b>½ day unit^</b>	<b>Programmes</b>
Access basic	5	B, EE, MB, BiMoS
Excel basic	3	B, EE, MB, BiMoS
Excel advanced	5	B, EE, MB, BiMoS

^ 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 (low student tariff), 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:**

<b>Course</b>	<b>ECTS</b>	<b>Programmes</b>
iGEM (International Genetically Engineered Machine competition)*	≤20	B, EE, MB, BiMoS

\* Selection for this competition takes place in winter time, an advertisement about application details will be announced via Nestor during the academic year.

**Appendix V. Compulsory order of examinations** (art 3.4)

<b>Course unit</b>	<b>Entry requirement</b>
Colloquium	Research project <a href="#">1</a> or <i>Behaviour, Ecology &amp; Evolution, and Evolutionary Theory</i>
Research project 2	Research project 1
<i>Biological Modelling &amp; Model Analysis</i>	<i>Mathematics in the Life Sciences</i>

## Appendix VI. Admission to the degree programmes 2019/2020

(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 ->	Overall	Reading	Listening	Speaking	Writing
<b>Test</b>					
<b>IELTS (Academic)</b>	6.5	6.5	6.5	6.5	6.5
<b>TOEFL IBT (internet-based)</b>	90	21	21	21	24
<b>Cambridge English</b>	CAE or CPE Certificate with a minimum score of 180				
<b>English language test – TC UG</b>	n/a	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 he/she 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. Education Support Centre compiles the individual selection file
2. Education Support Centre 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 ESC
4. ESC submits the individual selection file to Admissions Board of the individual programme

### **3 Selection procedure**

In order to select the best-suited and motivated students, the Admission Board require a complete selection file from all candidates. The Admission Board of the individual programmes will review all individual applicants based on their selection file. All candidates who meet the selection criteria 'academic performance' and 'motivation' (as specified by the different programmes) will be admitted. No maximum number of students applies.

At least two members of the Admissions 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 the academic performance and/or the motivation deviate 1 point or more, the members of the admissions board that gave scores have to confer, after which they score 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 score 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<sup>1</sup>:**

- Biostatistics (Introduction to Biomathematics and Biostatistics; Biostatistics N2\*)
- Evolution (Diversity and Evolution; Genes and Evolution; Evolutionary Ecology)
- Ecology (Diversity and Evolution, Ecology and Behaviour; Ecology and Behaviour; Systems Ecology; Evolutionary Ecology Systems Ecology; Ecological Interactions )
- Physiology (Physiology and Therapy; Complex Organism: Practical; Human and Animal Physiology)
- Cell biology (Biochemistry; Cell Biology; Genetics; Minimal Cell: Practical; Molecules and Reactivity)

*\*Please consult our on line catalogue [www. rug.nl/ocasys/](http://www.rug.nl/ocasys/) for the intended learning outcomes of the course units that adhere to these subjects:*

<sup>1</sup> *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 this. 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.<sup>2</sup>)

<sup>2</sup> *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 1 September 2019 will open on 1 October 2018 and will close on 1 May 2019. In September 2018, the details of the entire application procedure will be 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 Education Support Centre (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 will be offered placements between 1 October and 1 June (start 1 September).

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.