university of groningen

Appendices for the Master's degree programme(s) in Marine Biology

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

The graduate
1. a) has acquired in depth knowledge on one or more scientific disciplines within the field of Marine Biology and can use this knowledge to explain in detail the relevant concepts, using the appropriate terminology
b) has acquired a cross disciplinary knowledge of issues across scientific disciplines within the field of Marine Biology and can use this knowledge to explain current societal and scientific challenges for marine ecosystems, from the shore to the deep sea;
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 relevant 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.

Appendix II. Tracks/specializations (art. 3.6)

Within the degree programme Marine Biology, the student chooses one of the following tracks:

a. Research-track (R-track), which provides training as a researcher;
b. Science, Business and Policy -track, (SBP-track), which prepares for professions in a societal, political and/or commercial context.

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

The degree programme consists of:

Research-Track:

Study elements	**Course code**	**ECTS**	**entry requirements**
Principles of Biological Oceanography	WMMB003-05	5	
Principles of Marine Biology	WMMB004-05	5	
Principles of Populations Genetics in Natural Populations	WMMB005-05	5	
Marine Conservation	WMMB011-05	5	
research project (RP)*	WMMB90x-xx	40	see appendix V
research project (RP)*	WMMB90x-xx	30	see appendix V
colloquium	WMMB001-05	5	RP
electives**		≤25	see Ocasys

*SBP-Track***:**

Study elements	**Course code**	**ECTS**	**entry requirements**
Principles of Biological Oceanography	WMMB003-05	5	
Principles of Marine Biology	WMMB004-05	5	
Principles of Populations Genetics in Natural Populations	WMMB005-05	5	
Marine Conservation	WMMB011-05	5	
Introduction Science and Business	WMSE001-10	10	
Introduction Science and Policy	WMSE002-10	10	
research project (RP)*	WMMB901-xx	≥30	see appendix V
Work placement Business & Policy	WMSE902-40	40	see appendix V
colloquium	WMMB001-05	5	RP
electives**		≤5	see Ocasys

In addition to the above scheme, the following rules apply:

- *Study Mentor* The student is provided a mentor from the list of Marine Biology to get advice on and discuss the contents of the individual degree programme before approval of the Board of Examiners.

- *RP and Work Placement* (*) 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 subject of the SBP work placement and the compulsory master course must be clearly related to the scientific domain of the chosen master programme (see Appendix I, 1). Therefore, two examiners must be involved in the assessment of the internship: one SBP-examiner and one appointed examiner of the master programme.

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

- *Individual study components* 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.

- Students within the degree programme Marine Biology may use the title Marine Scientist of the Netherlands when they have fulfilled the requirements of their programme and passed one of the annual field courses organized by the NIOZ, the Royal Netherlands Institute for Sea Research (Texel).

- 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.

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, or other universities in the Netherlands or abroad.

Master courses organised by the research institutes GELIFES and ESRIG:

Course	Course code	ECTS
Academic Skills in Marine Biology	WMMB015-05	5
Advanced Population & Community Ecology*	WMEV008-05	5
Advanced Statistics	WMBY018-06	6
Behaviour, ecology & evolution*	WMEV003-10	10
Conservation Ecology Practices*	WMEV004-05	5
Ecological research skills*	WMEV005-10	10
Ecology of Sustainable Farming (biennial, *runs in 2025-2026*)	WMEV009-05	5
Evolutionary theory*	WMEV006-05	5
Flyway ecology	WMEV010-05	5
Genomics in ecology and evolution*	WMEV011-05	5
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
Modelling Complex Biological Systems	WMBY027-05	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
Programming in C++ for biologists ***	WMBY010-05	5
Polar ecosystems	WMMB009-05	5
Research proposal Ecology and Evolution*	WMEV012-05	5

* Students MSc Ecology and Evolution have priority in enrolment. Students are only allowed to take either Behaviour, Ecology and Evolution or Ecological Research Skills as part of their study programme of 120 ECTS.
** Course unit only possible in combination with an MSc research project involving animals.
*** 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.

Master course organised by Royal Netherlands Institute of Sea Research:

Course	ECTS
NIOZ Marine Masters' Summer Course	4

Electives organised by the research institute GBB and Gelifes:

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 2024-2025)	WMBS013-xx	≤20
ISCOMS conference	WMBM029-01	1
Microbiological safety	WMMP004-01	1
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.

Electives organised by Science & Society:

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

Elective organised by Spatial Sciences:

Course	Course code	ECTS
Transitions in water management	GEMTRWATM	5

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 Chemistry:

Course	Course code	ECTS
Advances in chemical biology	WMCH014-05	5
Biophysical Imaging and Manipulation Techniques	WMPH047-05	5
Synthetic biology & systems chemistry	WMCH021-05	5

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
Research project 2	Research project 1
Work placement Business & Policy	Research project, Introduction Science & Policy, Introduction Science & Business

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 Marine Biology

Holders of the following Bachelor's degrees are considered to have sufficient knowledge and skills to be admitted to the ranking list to the Master's degree programme in Marine Biology on that basis:

- Holders of a Bachelor's degree in Biology from the University of Groningen, with the major Ecology and Evolution;

For holders of another relevant academic Bachelor's degree with a specialization in biology, ecology, evolution, theoretical biology, behaviour, marine biology, molecular biology, genetics there is an individual admission procedure based on the content of the bachelor's programme and language skills,
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 the key subjects/courses

- 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 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 30.

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 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.

1. Academic performance (60%)

The score on academic performance is the 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 3 key subjects/courses demonstrating the knowledge and skill(s) acquired by the student).

Key subjects[1];

1. Basic training in Biology (Basic Cell & Molecular Biology, Microbiology)
2. Research methodology (Biostatistics 1+2, Modelling Life, Research Course, Research Skills in Ecology & Evolution 1+2 OR Research Skills in Life Sciences 1+2+3)
3. Ecology (Behavioural Neuroscience, Evolutionary Ecology, Research Skills in Ecology & Evolution 1+2, Systems Ecology & Ecological Interactions)
4. Evolution and Genetics (Evolutionary Ecology, Genes & Evolution, Genetics Ecology & Evolution, Research Skills in Ecology & Evolution 1+2)
5. Physiology (Physiology, Ecophysiology of Plants & Animals)

[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.*

2. 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 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. On what topic and with which researcher/research group would you like to do your first research project, and why?

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 15th of March. 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 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.

The Admission Board will carry out the ranking. The top 30 students will be offered placements within 4 to 6 weeks after the deadline.

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 ranked within the cap 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 a Pre-Master's programme for access to the MSc Marine Biology and individually determined Pre-Master's programmes. The overview below shows:
   - which NVAO-accredited HBO (University of Applied Sciences) diploma grants access to the MSc Marine Biology;
   - The content and student workload for these fixed programmes.

   a. The following types of HBO qualification qualifies for participation in the selection procedure:
   - Bachelor Coastal and Marine Management (major Marine Biology) (CROHO 39204)
   - (Applied) Biology (CROHO 330009)

The Pre-master's programme of 38 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
- Microbiology (period 1b), 5 ECTS
- Lab Course (period 1b), 3 ECTS
- Biostatistics 1 (period 1b), 5 ECTS
- Biostatistics II (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. as the MSc Marine Biology is a selective Master programme with a cap, a maximum of 5 pre-master students is selected after the deadline based on above listed criteria.
   c. a completed premaster in Marine Biology also gives access to the MSc Biology.

* subject to availability

Appendix VIII. Transitional provisions (art. 7.1)

The essay, WMMB002-05 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 Marine Biology.

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.