



Teaching and Examination Regulations

MASTER's Degree Programme

B. Programme-specific section

M Ecology

Academic year 2017-2018

Section B: Programme-specific section

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Section B: Programme-specific section

1. General provisions

Article 1.1 Definitions

In addition to the definitions as laid down in article 1 of TER part A, the following abbreviations and terms are also used in TER part B:

Abbreviations and terms	Meaning
CROHO	Centraal Register Opleidingen Hoger Onderwijs Tentamen
EC	European Credit (Studiepunten)
E&E	Specialization Ecology and Evolution.
IMABEE	International MAster of Biodiversity, Ecology and Evolution
TER	Teaching and Examination Regulation
WHW	Wet op het hoger onderwijs en wetenschappelijk onderzoek

The examination and teaching methods that are used per educational unit can be found in the study guide.

Article 1.2 Degree programme information

1. The masters' programme Ecology CROHO number 60607 is offered on a full-time basis and the language of instruction is English.
2. The programme has a workload of 120 EC.
3. A unit of study comprises 6 EC or a multiple thereof.
The following units of study are of different size:
 - Masterclasses in Ecology and Evolution (AM_1016, 3 EC)
 - Scientific Writing in English (AM_471023, 3 EC)
4. This programme is offered in partnership with the University of Amsterdam.

Article 1.3 Intake dates

The programme is offered starting in the first semester of the academic year only (1 September). The intake date mentioned in this paragraph ensures that a programme can be completed within the nominal study duration set for the programme.

2. Programme objectives and exit qualifications

Article 2.1 Programme objective

The programme aims to provide students with the knowledge, skills and insights required to operate as an independent professional within the field of Ecology and Evolution and to be a suitable candidate for a subsequent PhD study leading to a career in fundamental or applied research. As a consequence it is a research-oriented programme. Having completed the programme the student should have developed a critical, scientific attitude and an awareness of the ethical and social aspects of Ecology.

The programme offers a broad package of courses and research experiences that provide a firm theoretical and practical basis for a Masters' degree with a distinct, individual profile within the array of ecological sub-disciplines.

Article 2.2 Exit qualifications

In all events, a graduate of the degree programme will have the following learning outcomes:

Learning outcomes of the MSc Ecology programme according to the Dublin descriptors:

Dublin descriptor 1

Knowledge and understanding: The graduate should have specialized theoretical and practical knowledge of ecological science notably within the field of his/her specialization.

The graduate:

- 1 masters the field's conceptual framework, understands the state of the art in terms of developing theories and has insight into the most important current research issues in ecology,

- 2 appreciates the place of this discipline within Biology and the Natural Sciences,
- 3 appreciates the scientific and social relevance of ecology,
- 4 is able to think in multidisciplinary terms,
- 5 has sufficient knowledge of and is able to apply appropriate mathematical and statistical methods and computer software.

Dublin descriptor 2

Application of knowledge: The graduate should be experienced in carrying out research, in applying techniques specific to the subject area and in applying scientific knowledge to problems raised in society.

The graduate:

- 1 is able to design and perform experiments in the different ecological fields and analyse their results,
- 2 has command of the relevant advanced research techniques and laboratory procedures,
- 3 is able to transmit his/her scientific knowledge to societal and political issues,
- 4 is able to reflect on the ethical aspects of research and its uses.

Dublin descriptor 3

Critical judgment: The graduate should be able to independently and critically judge information.

The graduate:

- 1 is able to independently and critically analyse ecological research,
- 2 is able to independently acquire, analyse and critically evaluate ecological information from the literature at a meta level,
- 3 has the ability to evaluate his/her own performance, both introspectively and in discussion with others.

Dublin descriptor 4

Communication: The graduate should be able to transfer knowledge and skills related to his/her subject area to other persons and to adequately reply to questions and problems posed within society.

The graduate:

- 1 can report orally on research results to a scientific audience in English with support of modern presentation techniques,
- 2 can report in written form on research results on the level of peer-reviewed academic journals (in English),
- 3 can make essential contributions to scientific discussions,
- 4 can operate professionally in a research team.

Dublin descriptor 5

Learning skills: The graduate should develop learning skills that enable him/her further self-education and development within the subject area.

The graduate:

- 1 is able to draw up a research proposal developing new research questions and directions, giving details of experimental design, performance and analysis,
- 2 is familiar with general scientific journals such as Nature and Science, and with high impact professional journals in ecology,
- 3 able to evaluate and reflect on scientific contributions of peers,
- 4 can make a well-considered choice for a specialized PhD trajectory, or other positions at the labour market.

3. Further admission requirements

Article 3.1 Admission requirements

1. Admission to the Master's programme is possible for an individual who can demonstrate that he/she has the following knowledge, understanding and skills at the Bachelor's degree level, obtained at an institution of academic higher education:
 - a. *Knowledge and understanding*:
 - Basic biological knowledge in the fields of Biochemistry and Cell Biology (insight into molecular and cellular processes in living organisms),

- Genetics (both at the organismal and population level),
- Evolutionary biology (origin and development of life, processes of speciation, relationship between and within taxa, building plans of the most important groups),
- Ecology (understanding of ecosystems, the ecological processes that play a role within them and the interrelationship of those processes, behavioural ecology),
- Animal and Plant Physiology (the function at supra-cellular level, insight into the construction and function of the main tissues, organs and organ systems and the regulation of their operation)
- Knowledge and understanding of basic statistical (t-test, regression and correlation analysis, analysis of variance, non-parametric tests) and mathematical principles and techniques (differentiation and integration, ordinary differential equations).

b. Skills:

- The ability to collect data in a systematic way by means of observations during (laboratory) research and fieldwork, using literature review or internet sources,
 - The ability to manage the collected data and observations in relation to each other, save, process, interpret them and write a scientific report that meets the bachelor level,
 - The ability to clearly define a biological question, along with accompanying assumptions – and to determine a strategy for answering the question (under guidance),
 - The ability to analyse research on main lines, both with regard to the design and conduct of research and to the interpretation of results.
2. The Admissions Board will investigate whether the interested person meets the admission requirements.
 3. In addition to the requirements referred to in the first paragraph, the Board will also assess requests for admission in terms of the following criteria:
 - a. talent and motivation;
 - b. proficiency in methods and techniques; i.e. the ability to work with computer programs in the field of: word processing, spreadsheets, modelling, statistical processing, graphics, presentations, management of databases and consultation of scientific literature;
 4. Direct admission is granted to students with a Bachelor of Science degree in Biology from a Dutch university.

Admission is also provided to VU students with a Bachelor's degree in Biomedical Sciences or Health and Life Sciences, with an examination programme that includes at least the following components:

 - o Minor Evolutionary Biology and Ecology (30 EC)
 - o Levensgemeenschappen en Ecosystemen (AB_1208, 12 EC)
 - o Evolutionaire Ecologie en Gedrag (470951, 6 EC)
 5. In addition to the requirements referred to in the paragraphs 1 and 3, the Board will also assess requests for admission in terms of the following criteria for students coming from outside European Economic Area:
 - a. Average grades for classes in ecological, evolutionary, genetic, physiological and statistical subjects should be within the top 30 %. (i.e. 7 or higher for Dutch grades, 14 or higher in the French system, B or A for USA or UK grades and, 2 or 1 for German grades).
 - b. The period between the obtaining of the Bachelor's degree and the start of the master's programme should not be longer than 5 years, unless, according to the Admission Board the applicant has been able to maintain and update his/her knowledge sufficiently by taking additional courses or by working in the field.
 6. When the programme commences, the candidate must have fully completed the Bachelor's programme or pre-Master's programme allowing admission to this Master's programme.

Article 3.2 Pre-Master's programme

1. Students with a Bachelor's degree in a field that corresponds to a sufficient extent with the subject area covered by the Master's programme can request admission to the pre-Master's programme.
2. The pre-Master's programme comprises 6-30 EC and is made up of the following units of study. The exact content is determined by the deficiencies remaining despite the previous education of the candidate. It may contain one or more of the following course components from the BSc Biology programme (but components from other programmes are possible):
 - Evolutie en diversiteit van het leven (AB_470175, 12 EC)
 - Methodologie en Onderzoek in de Biologie (AB_470209, 6 EC)
 - Biochemie en Systeembioogie (AB_1040, 6 EC)
 - Voorspellen en Analyseren in de Biologie (AB_470212, 6 EC)

Ecologie, Mens en Natuur I (AB 1001, 6 EC Ecologie, Mens en Natuur II (AB 1002, 6 EC) Levensgemeenschappen en Ecosystemen (AB_1208, 12 EC) Evolutionaire Ecologie en Gedrag (AB 470074, 6 EC) Evolutionary Genetics (AB 1022, 6 EC)

3. Proof of a successfully completed pre-Master's programme serves as proof of admission to the Master's programme specified within it in the subsequent academic year.

Article 3.3 Limited programme capacity

Not applicable

Article 3.4 Final deadline for registration

A candidate must submit a request to be admitted to the programme through Studielink before 1 June in the case of Dutch students, before 1 April in the case of EU students and before 1 February in the case of non-EU students. Under exceptional circumstances, the Examinations Board may consider a request submitted after this closing date.

Article 3.5 English language requirement for English-language Master's programmes

1. The proficiency requirement in English as the language of instruction can be met by the successful completion of one of the following examinations or an equivalent:
 - IELTS: 6.5 (Minimum Sub-scores: Listening 6.0, Reading 6.0, Writing 6.5 and Speaking 6.0)
 - TOEFL paper based test: 580 (Minimum Sub-scores: Listening Comprehension 58, Structure and Written Expression 59 and Reading Comprehension 58)
 - TOEFL internet based test: 92-93 (Minimum Sub-scores: Listening 19, Reading 18, Writing 24 and Speaking 19)
 - Cambridge Advanced English: A, B or C.
2. Exemption is granted from the examination in English referred to in the first paragraph to students who, within two years of the start of the programme:
 - met the requirements of the VU test in English language proficiency TOEFL ITP, with at least the scores specified in paragraph 1, or
 - had previous education in secondary or tertiary education in an English-speaking country as listed on the VU website, or
 - have an English-language 'international baccalaureate' diploma.

Article 3.6 Free curriculum

1. Subject to certain conditions, the student has the option of compiling a curriculum of his/her own choice which deviates from the curricula prescribed by the programme.
2. The concrete details of such a curriculum must be approved beforehand by the most appropriate Examinations Board.
3. The free curriculum is put together by the student from the units of study offered by Vrije Universiteit Amsterdam or another institution of higher education and must at least have the size, breadth and depth of a regular Master's programme.
4. The following conditions must at least have been met in order to be eligible for the Master's degree:
 - a. 60 EC must be obtained from the regular curriculum,
 - b. the level of the programme must match the objectives and exit qualifications that apply for the programme for which the student is enrolled.

4. Curriculum structure

Article 4.1 Composition of programme

1. The programme consists of the following components:
 - a. compulsory course components (18 EC)
 - b. elective course components (12 - 18 EC)
 - c. two research projects (72 - 78 EC)
 - d. a literature survey (12 EC)

Students are free to spend 6 EC to either an elective course or to expand one of their research projects with 6 EC.

The shortest research project is at least 30 EC.

The first research project has to take place at the Vrije Universiteit or the University of Amsterdam.

Article 4.2 Compulsory units of study

The compulsory units of study are:

Year 1

Name of course component	Course code	Number of credits	Period or semester	Level
Current Trends in Evolution	AMU_0003	6	1	500
Masterclasses in Ecology and Evolution	AM_1016	3	1,2,3,4,5,6	400
Experimental Design and Analysis	AM_470505	6	2	500
Scientific Writing in English	AM_471023	3	4	400
Research Project E&E I	AM_1100	30≤EC≤48	4,5,6	600

Year 2

Name of course component	Course code	Number of credits	Period or semester	Level
Research Project E&E II	AM_1114	30≤EC≤48	1,2,3,4,5,6	600
Literature Survey E&E	AM_1131	12	1,2,3,4,5,6	500

Article 4.3 Practical exercise

Research Project E&E I

Research Project E&E II

Article 4.4 Electives

1. The student can take two or more of the following electives:

Name of course component	Course code	Number of credits	Period or semester	Level
Soil-Plant-Animal Interactions	AM_470507	6	1	500
Environmental Genomics and Adaptation	AM_470506	6	2	500
Evolution of Species Interactions	AMU_0006	6	2	500
Ecosystem Services and Scientific Advocacy	AM_1053	6	1	500
Microbial Ecology	AMU_0008	6	1	500
Spatial Processes in Ecology and Evolution	AMU_0009	6	1	500
Ecotoxicology and Water Quality	AMU ...	6	2	400
Environments through time	AMU_...	6	2	500

2. In the second year, provided that all the courses of the 1st semester of the 1st year have been completed above average, it is possible to enter the International MAster of Biodiversity Ecology and Evolution (IMABEE). This means that the 2nd semester can be followed at one of the partner universities (University of Rennes, France; University of Göttingen, Germany; University of Aarhus, Denmark).

3. If the student wishes to take a different course than the units of study listed, advance permission must be obtained in writing from the Examinations Board.

Article 4.5 Sequence of examinations

Participation in the following components is only possible if at least 18 EC of course components have been obtained in the concerned specialization:

AM 1100: Research Project E&E I

AM 1114: Research Project E&E II

Article 4.6 Participation in practical exercise and tutorials

- In the case of a practical, the student must attend 100 % of the practical sessions. Should the student attend less than 100 %, he/she must repeat the practical, or the examiner of the course may have one or more supplementary assignments issued.
- In the case of a work group with assignments, the student must attend 100 % of the work group sessions. Should the student attend less than 100 %, he/she must repeat the work group, or the examiner of the course may have one or more supplementary assignments issued.
- In exceptional circumstances, the Examinations Board may, at the request of the student, permit an exemption from this requirement if, in the opinion of the Board, the assessment of

the intended skills is also possible with a lesser percentage of participation, with or without the imposition of supplementary requirements.

Article 4.7 **Maximum exemption**

A maximum of 40 EC of the curriculum can be accumulated through granted exemptions.

Article 4.8 **Validity period for results**

The validity period of examinations and exemptions from examinations is limited to 6 years.

Article 4.9 **Degree**

Students who have successfully completed their Master's final examination are awarded a Master of Science degree. The degree awarded is stated on the diploma. If it is a joint degree, this will also be stated on the diploma.

5. Transitional and final provisions

Article 5.1 **Amendments and periodic review**

1. Any amendment to the Teaching and Examination Regulations will be adopted by the faculty board after taking advice, and if necessary approval by the Programme Committee concerned. A copy of the advice will be sent to the authorized representative advisory body.
2. An amendment to the Teaching and Examination Regulations requires the approval of the authorized representative advisory body if it concerns components not related to the subjects of Section 7.13, paragraph 2 sub a to g and v of the WHW and the requirements for admission to the Master's programme.
3. An amendment to the Teaching and Examination Regulations can only pertain to an academic year that is already in progress if this does not demonstrably damage the interests of students.

Article 5.2 **Transitional provisions**

Notwithstanding the current Teaching and Examination Regulations, the following transitional provisions apply for students who started the programme under a previous set of Teaching and Examination Regulations:

Not applicable

Article 5.3 **Publication**

1. The faculty board will ensure the appropriate publication of these Regulations and any amendments to them.
2. The Teaching and Examination Regulations will be posted on VUnet.

Article 5.4 **Effective date**

These Regulations enter into force with effect from 1 September 2017

Advice from Programme Committee on 8 March 2017

Approved by authorized representative advisory body on 6 July 2017

Adopted by the Faculty Board on 21 July 2017

Appendix I

List of articles that must be included in the TER pursuant to the WHW (articles in framed boxes):

Section A

Art. 1.1	7.13, para 1, WHW
Art. 2.1	7.13, para 2 sub w
Art. 3.2	7.13, para 2 sub e
Art. 4.2	7.13, para 2 sub h and l
Art. 4.3	7.13, para 2 sub n
Art. 4.4	7.13, para 2 sub o
Art. 4.5	7.13, para 2 sub j, h
Art. 4.7	7.13, para 2 sub r
Art. 4.8	7.13, para 2 sub k
Art. 4.9	7.13, para 2 sub p
Art. 4.10	7.13, para 2 sub q
Art. 4.11	7.13, para 2 sub a
Art. 5.1	7.13, para 2 sub u
Art. 5.2	7.13, para 2 sub m

Section B

Art. 1.2	7.13, para 2 sub i
Art. 2.1	7.13, para 1 sub b, c
Art. 2.2	7.13, para 2 sub c
Art. 3.1	7.25, para 4
Art. 4.1	7.13, para 2 sub a
Art. 4.2	7.13, para 2 sub e, h, j, l
Art. 4.3	7.13, para 2 sub t
Art. 4.4	7.13, para 2 sub e, h, j, l
Art. 4.5	7.13, para 2 sub s
Art. 4.6	7.13, para 2 sub d
Art. 4.8	7.13, para 2 sub k