



Ecology MSc

Vrije Universiteit Amsterdam - Fac. der Aard- en Levenswetenschappen - M Ecology - 2014-2015

The aim of the Master programme Ecology is to provide you with the knowledge, skills and insight required to operate as an independent professional and to be a suitable candidate for a subsequent course of study leading to a career in Ecological research. After having completed the programme, you will have developed a critical scientific approach and an awareness of the ethical and societal aspects of Ecology.

The programme has two specialisations: 'Ecology and Evolution' and 'Environmental Chemistry and Toxicology'. These specialisations are organised in close cooperation with the University of Amsterdam (UvA). This implies that some (course) components will take place at the Science Park of UvA and others at the VU campus. In all courses teachers of both universities will be participating.

Each course is given at one or the other university, so teachers move between classes. In general elective courses are given every two years (except Adaptive Dynamics and Biodiversity and Landscapes that can be taken every year).

When registered in the MSc Ecology programme of the VU you will also automatically be registered as a 'bijvakstudent' at the UvA (similarly for UvA students). You will thus be assigned a VUnetID and a UvAnetID. You should enrol for VU (course) components at: vunet.vu.nl using your VUnetID and for UvA (course) components: <http://datanose.nl/#masterenrol> with your UvAnetID.

You can find the content, study load and other details of each of the course modules in the course descriptions in this guide.

You can find all regulations applying to the classes and examinations of the Master's programme in Ecology in the [Academic and Examination Regulations](#) of the Master's Programme Ecology at the FALW website.

The year schedule 2014 - 2015 can be found at the [FALW-website](#). Further information about the MSc programme [Ecology](#).

Note: Not every course is given each year, so please consult the year schedules for further information.

Inhoudsopgave

Expired programme components Ecology	1
MSc Ecology, spec. Ecology and Evolution	1
MSc Ecology, spec. Environmental Chemistry and Toxicology	2
Vak: (Bio)Molecular Spectroscopy (Periode 5)	2
Vak: Assessment of Nat. and Chem. Hazards (Periode 4)	3
Vak: Assessment of Natural and Chemical Hazards (Ac. Jaar (september))	4
Vak: Biogeochemical cycles (Ac. Jaar (september))	4
Vak: Biogeochemical Cycles (Periode 4)	4
Vak: Current Trends in Evolution (Ac. Jaar (september))	5
Vak: Current Trends in Evolution (Periode 1)	5
Vak: Ecosystem Services and Sc. Advocacy (Periode 1)	5
Vak: Ecotoxicology and Environmental Quality (Ac. Jaar (september))	7
Vak: Ecotoxicology and Water Quality (Periode 2)	9
Vak: Environmental Chemistry and Tox. II (Periode 1)	11
Vak: Environmental Chemistry and Toxicology I (Periode 1)	11
Vak: Environmental Chemistry and Toxicology II (Ac. Jaar (september))	13
Vak: Environmental Genomics and Adaptation (Periode 2)	14
Vak: Environmental Measuring Techn. (Periode 2)	16
Vak: Environmental Measuring Techniques (Ac. Jaar (september))	16
Vak: Ethics in Life Sciences (Periode 3)	16
Vak: Evolution of Species Interaction (Periode 2)	18
Vak: Evolution of Species Interactions (Ac. Jaar (september))	18
Vak: Evolutionary Dynamics (Ac. Jaar (september))	19
Vak: Evolutionary Dynamics (Periode 4+5+6)	19
Vak: Experimental Design and Analysis (Periode 2)	20
Vak: Literature Survey E&E (Ac. Jaar (september))	22
Vak: Literature Survey ECT (Periode 4+5+6)	23
Vak: Mass Spectrometry (Periode 2)	24
Vak: Masterclasses in Ecology and Evolution (Ac. Jaar (september))	24
Vak: Microbial Ecology (Periode 1)	26
Vak: Research Project Ecology and Evolution 1 (Ac. Jaar (september))	26
Vak: Research Project Ecology and Evolution II (Ac. Jaar (september))	28
Vak: Research Project Environmental Chemistry and Toxicology I (Ac. Jaar (september))	30
Vak: Research Project Environmental Chemistry and Toxicology II (Ac. Jaar (september))	32
Vak: Scientific Writing in English (Ac. Jaar (september))	33
Vak: Separation Sciences (Periode 1)	36
Vak: Soil-Plant-Animal Interactions (Periode 1)	37
Vak: Spatial Processes in Ecology (Periode 1)	38
Vak: Spatial Processes in Ecology and Evolution (Ac. Jaar (september))	38

Expired programme components Ecology

Courses:

Name	Period	Credits	Code
Assessment of Natural and Chemical Hazards	Ac. Year (September)	6.0	AM_1042-UvA
Biogeochemical cycles	Ac. Year (September)	6.0	AM_1043-UvA
Current Trends in Evolution	Ac. Year (September)	6.0	AM_1038-UvA
Ecotoxicology and Environmental Quality	Ac. Year (September)	6.0	AM_470512
Environmental Chemistry and Toxicology II	Ac. Year (September)	6.0	AM_1033
Environmental Measuring Techniques	Ac. Year (September)	6.0	AM_1041-UvA
Evolution of Species Interactions	Ac. Year (September)	6.0	AM_1017-UvA
Evolutionary Dynamics	Ac. Year (September)	6.0	AM_1019
Spatial Processes in Ecology and Evolution	Ac. Year (September)	6.0	AM_1039-UvA

MSc Ecology, spec. Ecology and Evolution

Courses:

Name	Period	Credits	Code
Current Trends in Evolution	Period 1	6.0	AMU_0003
Ecosystem Services and Sc. Advocacy	Period 1	6.0	AM_1053
Environmental Genomics and Adaptation	Period 2	6.0	AM_470506
Ethics in Life Sciences	Period 3	3.0	AM_470707
Evolution of Species Interaction	Period 2	6.0	AMU_0006
Evolutionary Dynamics	Period 4+5+6	6.0	AMU_0007
Experimental Design and Analysis	Period 2	6.0	AM_470505
Literature Survey E&E	Ac. Year (September)	12.0	AM_1131
Masterclasses in Ecology and Evolution	Ac. Year (September)	3.0	AM_1016
Microbial Ecology	Period 1	6.0	AMU_0008
Research Project Ecology and Evolution 1	Ac. Year (September)	30.0	AM_1100
Research Project Ecology and Evolution II	Ac. Year (September)	30.0	AM_1114

Scientific Writing in English	Ac. Year (September)	3.0	AM_471023
Soil-Plant-Animal Interactions	Period 1	6.0	AM_470507
Spatial Processes in Ecology	Period 1	6.0	AMU_0009

MSc Ecology, spec. Environmental Chemistry and Toxicology

Courses:

Name	Period	Credits	Code
(Bio)Molecular Spectroscopy	Period 5	6.0	X_435062
Assessment of Nat. and Chem. Hazards	Period 4	6.0	AMU_0001
Biogeochemical Cycles	Period 4	6.0	AMU_0002
Ecotoxicology and Water Quality	Period 2	6.0	AM_1054
Environmental Chemistry and Tox. II	Period 1	6.0	AMU_0004
Environmental Chemistry and Toxicology I	Period 1	6.0	AM_1032
Environmental Genomics and Adaptation	Period 2	6.0	AM_470506
Environmental Measuring Techn.	Period 2	6.0	AMU_0005
Ethics in Life Sciences	Period 3	3.0	AM_470707
Experimental Design and Analysis	Period 2	6.0	AM_470505
Literature Survey ECT	Period 4+5+6	12.0	AM_1132
Mass Spectrometry	Period 2	6.0	X_435604
Masterclasses in Ecology and Evolution	Ac. Year (September)	3.0	AM_1016
Research Project Environmental Chemistry and Toxicology I	Ac. Year (September)	30.0	AM_1108
Research Project Environmental Chemistry and Toxicology II	Ac. Year (September)	30.0	AM_1113
Scientific Writing in English	Ac. Year (September)	3.0	AM_471023
Separation Sciences	Period 1	6.0	X_435609
Spatial Processes in Ecology	Period 1	6.0	AMU_0009

(Bio)Molecular Spectroscopy

Vakcode	X_435062 (435062)
Periode	Periode 5

Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. G.W. Somsen
Examinator	prof. dr. G.W. Somsen
Docent(en)	prof. dr. G.W. Somsen
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak

This course deals with interactions between light and molecules as studied and employed by optical spectroscopy. Goal of the course is to acquire a deeper knowledge of several spectroscopic principles and techniques frequently applied in (bio)analytical chemistry.

Inhoud vak

The course will start with an introduction to photophysical principles and fundamentals of molecular spectroscopy. Basic aspects of molecular orbitals, electronic transitions and quantummechanics will be treated. Basic properties of light and principal optical instrumentation will be discussed. The fundamentals, practice and applications of electronic spectroscopy (UV/Vis absorption, fluorescence, phosphorescence) and vibrational spectroscopy (infrared, Raman) will be systematically treated.

Onderwijsvorm

Lectures and problem solving sessions.

Toetsvorm

Written examination.

Literatuur

Lectures and problem solving sessions.

Vereiste voorkennis

Basic knowlegde on chemical structure, bonds and hybridization.

Aanbevolen voorkennis

Basic principles of molecular orbitals, energy levels and molecular vibrations. Basic experience with absorption spectrometry.

Doelgroep

mCh-AS

Assessment of Nat. and Chem. Hazards

Vakcode	AMU_0001 ()
Periode	Periode 4
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen

Inhoud vak

This is an UvA course. For the course description, please visit <http://studiegids.uva.nl/>

Assessment of Natural and Chemical Hazards

Vakcode	AM_1042-UvA ()
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen

Inhoud vak

This course is offered by the UvA. See for the description <http://studiegids.uva.nl/web/uva/sgs/nl/c/7775.html>

Overige informatie

Coordinator: Parsons (UvA).

The course description can be found on the UvA website:

http://studiegids.uva.nl/sgs/WebSite_nl.

Course registration via UvA, not VU.

Biogeochemical cycles

Vakcode	AM_1043-UvA ()
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen

Inhoud vak

This course is offered by the UvA. See for the description <http://studiegids.uva.nl/web/uva/sgs/nl/c/10611.html>

Overige informatie

Coordinator: Kalbitz (UvA).

The course description can be found on the UvA website:

http://studiegids.uva.nl/sgs/WebSite_nl.

Course registration via UvA, not VU.

Biogeochemical Cycles

Vakcode	AMU_0002 ()
Periode	Periode 4
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen

Inhoud vak

This is an UvA course. For the course description, please visit <http://studiegids.uva.nl/>

Current Trends in Evolution

Vakcode	AM_1038-UvA ()
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Niveau	500

Inhoud vak

This course is offered by the UvA. See for the course description:

<http://studiegids.uva.nl/web/uva/sgs/nl/c/741402.html>

Overige informatie

Coordinator: A. Groot (UvA).

The course description can be found on the UvA website:

http://studiegids.uva.nl/sgs/WebSite_nl.

Course registration via UvA, not VU.

Current Trends in Evolution

Vakcode	AMU_0003 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen

Inhoud vak

This is an UvA course. For the course description, please visit

<http://studiegids.uva.nl/>

Ecosystem Services and Sc. Advocacy

Vakcode	AM_1053 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. J.A. Harvey
Examinator	prof. dr. J.A. Harvey
Lesmethode(n)	Hoorcollege

Doel vak

1. To stimulate the students in developing critical ways to evaluate and interpret scientific information, and particularly information on issues related to society, ecosystem services and the environment.
2. To teach students to filter through a large body of information that broaches both science and society.

The final attainment levels of this course include that students

1. understand the natural (ecological) economy and the many ways in which it sustains the material (human) economy through the provisioning of conditions and processes that underpin civilization.
2. have the ability to evaluate the ways in which humans impact nature and how this is intimately linked with population and consumption patterns that differ between nation states.
3. know how to determine how sustainable (or not) different nations of the world are.
4. have the skills to critically evaluate the efficacy of information presented by various sources (the media, internet etc.) on scientific and environmental processes and problems.
5. can assess the role of scientists in studying and disseminating the results of their research to society, and whether their views should cross the threshold into the policy arena.

Inhoud vak

Four main topics with varying overlap and several themes.

1. Ecosystem services (ES) from an economic perspective; initial discussion of important ecosystem services (focusing on provisioning and supporting e.g. fisheries, crops, nutrient cycling, soil fertility, pest control etc. Five to six lectures envisaged by J. Harvey and several guest speakers. Assignment for students: provide an example of an ES that has been valued (quantifiably) by economists. Try and find one that falls in to the category of 'supporting' because these are the most problematic in terms of valuation and prepare a short presentation. Following this, discussion groups are assembled to debate and argue over the over- or under-valuation of the services studied. Votes are taken amongst the student body before and after the debate to see whose arguments are most convincing.
2. Indices measuring human impact on the biosphere and on important ES. Focuses on ecological footprint analyses (EFA) and how they relate to nation states and the biosphere as a whole. Five to six lectures envisaged by J. Harvey and several guest speakers. Assignment: select a country and evaluate/calculate its ecological footprint in an essay. Is the country sustainable? How much must it reduce its footprint to achieve sustainability?
3. Critical evaluation of information on ecology and environmental issues. How accurate is the media in covering issues such as climate change and biodiversity loss? What other sources of information compete for public attention? How accurate are blogs and web sites on the internet? Are there hidden (or not-so-hidden) agendas that are at work? How does one deal with the huge amount of information at our disposal? Five to six lectures envisaged by J. Harvey and several guest speakers. Assignment: presentation of an analysis of a newspaper or internet article on a recent environmental issue. Evaluate its accuracy of information and possible alternate agenda.
4. The role of scientists: how far should we step outside of the university and research labs in disseminating information? The costs (professional risks) and benefits (pro-active) of becoming involved in societal debates. Lectures by prominent scientists. Assignment: write a critical review or evaluation of an important environmental issue, and design a plan for accurately conveying information on the subject to the public through the media or internet.

Onderwijsvorm

Lectures and Workshops

Toetsvorm

Based on essays (50%) and presentations and contributions to workshops (50%)

Literatuur

Selected papers

Vereiste voorkennis

BSc in Biology, Earth and Economy, Future Planet Studies or Bèta-gamma with a minor in environmental science or ecology. Students with other previous education should contact the course coordinator.

Doelgroep

MSc students with a focus on ecological economics. The maximum number of participants is 50. Priority is granted to students in the MSc Ecology and Evolution programme of the VU and UvA.

Ecotoxicology and Environmental Quality

Vakcode	AM_470512 ()
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. ir. J. Legler
Examinator	prof. dr. ir. J. Legler
Docent(en)	prof. dr. ir. J. Legler
Lesmethode(n)	Hoorcollege, Practicum
Niveau	500

Doel vak

At the end of this course, students will have:

1. Gained theoretical knowledge of contaminants in the environment, their effects on organisms and ecosystems, and the assessment of water quality
2. Learned to determine the ecotoxicological effects of chemicals with laboratory toxicity testing
3. Developed a critical academic attitude in environmental management issues by combining scientific information and socio-economic arguments

Inhoud vak

This course is jointly organized by the VU University and the University of Amsterdam.

The course focuses on the contamination of aquatic ecosystems, from the molecular chemistry of major groups of toxicants to their impacts at the molecular, cellular, individual, population, and ecosystem level.

The first part of the course is a laboratory practical, in which students will gain hands-on experience in ecotoxicity testing using methods from bacteria, aquatic invertebrates and fish. Both whole-organism and molecular biological techniques are taught. Students will

evaluate scientific literature and the results of their experimental research to assess the risk of environmental contaminants for ecosystem health. At the end of the practical, students will present the results of their experimental work in a poster presentation.

The second theoretical part of the course will teach the student the state of the art in ecotoxicology. It is designed as a scientific symposium with invited lectures by internationally well-known guest lecturers. Students take the role of chairperson during these mini-symposia and introduce, pose questions and discuss critical issues with the lectures. Topics include emerging compounds, molecular mechanisms of toxicity, community ecotoxicology, water and sediment quality criteria and the EU Water Framework Directive. Scientific literature will be given as background information on each topic. The theoretical part ends with a symposium in which students present a critical evaluation of the topics presented.

Onderwijsvorm

- Laboratory practical course: 56 hours
- Lectures (introduction to practicals + scientific symposium): 36 hours
- Independent study: 68 hours

Toetsvorm

1. Written exam of 10 open questions (50% of mark)
2. Oral presentation of scientific symposium (25%)
3. Poster presentation of the laboratory practical course (25%).

The student has passed if each of the components has received a minimum of 5.0, and the final mark is equal to or higher than 5.5, in a range from 1-10.

Literatuur

A protocol for the practical will be provided.

For the theoretical part of the course, scientific articles will be provided by guest lecturers including:

Thomas KV, et al. Comparing illicit drug use in 19 European cities through sewage analysis. *Sci Total Environ.* 2012 Aug 15;432:432-9.

Paumen ML, et al. Multigeneration exposure of the springtail *Folsomia candida* to phenanthrene: from dose-response relationships to threshold concentrations. *Environ Sci Technol.* 2008 Sep 15;42(18):6985-90.

van Boxtel AL, et al. Microarray analysis reveals a mechanism of phenolic polybrominated diphenylether toxicity in zebrafish. *Environ Sci Technol.* 2008 Mar 1;42(5):1773-9.

Roessink I, et al. Impact of triphenyltin acetate in microcosms simulating floodplain lakes. II. Comparison of species sensitivity distributions between laboratory and semi-field. *Ecotoxicology.* 2006 Jul;15(5):411-24.

Boivin ME, et al. Algal-bacterial interactions in metal contaminated floodplain sediments. *Environ Pollut.* 2007 Feb;145(3):884-94.

Zweers, PGPC et al. Verification of a REACH Environmental Prioritization System against Regulatory Risk Indices. *Human and Ecological Risk Assessment.* 2012 in press.

Vereiste voorkennis

BSc in Biology, Ecology, Biomedical Sciences, Health Sciences, Earth Sciences, Chemistry or related fields

Aanbevolen voorkennis

BSc course in Environmental Toxicology (e.g. AB_1020) is recommended but not mandatory.

Doelgroep

Open to all MSc students in Biology, Ecology, Biomedical Sciences, Health Sciences, Earth Sciences, Chemistry or related fields. Compulsory course for MSc Ecology, ECT specialization

Overige informatie

Guest lecturers include Prof. Dr. P. de Voogt (UvA), Dr. M. Paumen Leon (Exxon Mobil), Dr. R. van der Oost (Waternet), Dr. H. van der Geest (UvA), Dr. I. Roessink (WUR), Dr. D. de Zwart, Dr. T. Traas, Dr. L. Posthuma and Dr. W. Verweij (RIVM)

Ecotoxicology and Water Quality

Vakcode	AM_1054 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. ir. J. Legler
Examinator	prof. dr. ir. J. Legler
Lesmethode(n)	Hoorcollege, Practicum

Doel vak

At the end of this course, students will have:

1. Gained theoretical knowledge of contaminants in the environment, their effects on organisms and ecosystems, and the assessment of water quality
2. Learned to determine the ecotoxicological effects of chemicals with laboratory toxicity testing
3. Developed a critical academic attitude in environmental management issues by combining scientific information and socio-economic arguments

Inhoud vak

This course focuses on the effects of contamination of aquatic ecosystems, from the molecular chemistry of major groups of toxicants to their impacts at the molecular, cellular, individual, population, and ecosystem level.

The first part of the course is a laboratory practical, in which students gain hands-on experience in ecotoxicity testing using methods from bacteria, aquatic invertebrates and fish. Both whole-organism and molecular biological techniques are taught. Students will evaluate scientific literature and the results of their experimental research to assess the risk of environmental contaminants for ecosystem health. At the end of the practical, students will present the results of their experimental work in a poster presentation.

The second part of the course is theoretical and will teach the student the state of the art in ecotoxicology. It is designed as a scientific symposium with invited lectures by internationally renowned guest lecturers as well as PhD candidates who present their PhD research in ecotoxicology. Students take the role of chairperson during the symposium and introduce the speakers, ask questions and discuss critical issues. Topics include emerging compounds, molecular mechanisms of toxicity, community effects, global environmental problems, and chemical regulation. Scientific literature will be given as background information on each topic. The symposium is finalized with oral presentations in which students present a critical evaluation of the topics presented.

Onderwijsvorm

- Laboratory practical course: 56 hours
- Lectures (introduction to practicals + scientific symposium): 36 hours
- Independent study: 68 hours

Toetsvorm

1. Participation in laboratory practical course, including lab journal (15%)
2. Poster presentation of the laboratory practical course (35%).
3. Oral presentation of scientific symposium (15%)
4. Written exam of 10 open questions (35% of mark)

The student has passed if each of the components has received a minimum of 5.0, and the final mark is equal to or higher than 5.5, in a range from 1-10.

Literatuur

Protocols for the laboratory practical will be provided.

For the theoretical part of the course, scientific articles will be provided by guest lecturers including:

Thomas KV, et al. Comparing illicit drug use in 19 European cities through sewage analysis. *Sci*

Total Environ. 2012 Aug 15;432:432-9.

van Boxtel AL, et al. Microarray analysis reveals a mechanism of phenolic polybrominated diphenylether toxicity in zebrafish. *Environ Sci Technol.* 2008 Mar 1;42(5):1773-9.

Roessink I, et al. Impact of triphenyltin acetate in microcosms simulating floodplain lakes. II. Comparison of species sensitivity distributions between laboratory and semi-field. *Ecotoxicology.* 2006 Jul;15(5):411-24.

Boivin ME, et al. Algal-bacterial interactions in metal contaminated floodplain sediments. *Environ Pollut.* 2007 Feb;145(3):884-94.

Zweers, PGPC et al. Verification of a REACH Environmental Prioritization System against Regulatory Risk Indices. *Human and Ecological Risk Assessment.* 2012

Vereiste voorkennis

BSc in Biology, Ecology, Biomedical Sciences, Health Sciences, Earth Sciences, Chemistry or related fields

Aanbevolen voorkennis

BSc course in Environmental Toxicology (e.g. AB_1020) is recommended but not mandatory.

Doelgroep

Open to all MSc students in Biology, Ecology, Biomedical Sciences, Health Sciences, Earth Sciences, Chemistry or related fields. Compulsory course for MSc Ecology, ECT specialization. Optional course for UvA MSc Biology, L&O track.

Overige informatie

For more information, please contact: Prof. dr. ir J. Legler, Room A-645, 020-5989516, juliette.legler@vu.nl

Environmental Chemistry and Tox. II

Vakcode	AMU_0004 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen

Inhoud vak

This is an UvA course. For the course description, please visit <http://studiegids.uva.nl/>

Environmental Chemistry and Toxicology I

Vakcode	AM_1032 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. ir. J. Legler
Examinator	prof. dr. ir. J. Legler
Docent(en)	dr. ir. C.A.M. van Gestel, prof. dr. ir. J. Legler, dr. ir. T.H.M. Hamers, dr. D.T. Jager
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak

This course will teach you to evaluate the exposure to and effects of chemicals in the environment.

Environmental Chemistry and Toxicology (ECT) integrates two disciplines: environmental chemistry and environmental toxicology. This ECT I course focuses on environmental toxicology, which deals with effects of chemicals in the environment on wildlife and human health, covering the realm of effects ranging from molecular and cellular to whole organism and ecosystem effects. This course can be taken together with ECT II (AM_1033), which focusses on environmental chemistry deals with the sources and fate of chemicals, as well as their environmental partitioning and transport, degradation and deposition.

General aim:

The main aim of the course Environmental Chemistry and Toxicology I is to understand the biological effects of chemicals in the environment on organisms, including humans.

Learning objectives

At the end of the course you will have learned

1. The main questions and key concepts in the field of environmental toxicology
2. To think critically in environmental quality and risk assessment issues
3. To present scientific results (both written and oral) and place them in the appropriate scientific context

Inhoud vak

Students will obtain a sound theoretical background in the major concepts in toxicology. Topics include chemical uptake and metabolism, molecular mechanism of toxicity, biochemical and physiological effects, community and population effects. Major groups of toxicants that will be discussed include pesticides, persistent organic pollutants and endocrine disrupting chemicals, as well as mixture toxicity. Toxicity testing and dose-response modeling are covered. Students will also research the main incidents and disasters involving chemicals in history. One important aspect of the course is the risk assessment of chemicals: when do we say that the exposure to a chemical is safe and when is it hazardous? Students will learn how to perform risk assessment as it is done in the real world, taking into account the exposure, effects on humans and wildlife, and other mitigating factors.

Onderwijsvorm

This course contains a series of lectures, seminars and working classes. Students prepare a scientific report on an important historical disaster involving chemicals and the impact of this disaster on the risk assessment of chemicals, and present their results in a series of presentations.

Lectures: 44 hours

Working classes: 12 hours

Presentations: 12 hours

Toetsvorm

The course is completed with a written exam worth 50% of the final mark. The environmental disaster report is worth 25% of the final mark. Oral presentations and the participation of the students in the course make up the final 25% of the course. The student has passed if the final mark is equal to or higher than 5.5 in a range from 1-10. Each component of the course (exam, report and presentations) must achieve a 5.0 or higher to pass.

Literatuur

Suggested reading: Walker et al, Principles of Ecotoxicology, 4th Edition, 2012, ISBN 978-1-4398-6266-7

Vereiste voorkennis

This course is open to all Master students with a BSc in Biology, Biomedical Sciences, Ecology or Chemistry. It is a compulsory course for MSc Ecology – ECT track students. For more information and to determine if you have sufficient background to take this course, please contact the coordinator (juliette.legler@vu.nl)

Aanbevolen voorkennis

This course is open to all Master students with a BSc in Biology, Biomedical Sciences, or Chemistry. It is a compulsory course for MSc Ecology – ECT track students. For more information and to determine

if you have sufficient background to take this course, please contact the coordinator (juliette.legler@vu.nl)

Doelgroep

This course is open to all Master students with a Biology, Ecology or Chemistry BSc. It is a compulsory course for MSc Ecology – ECT track students and can be followed in combination with ECT II (see AM_1033).

Environmental Chemistry and Toxicology II

Vakcode	AM_1033 ()
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. ir. J. Legler
Examinator	prof. dr. ir. J. Legler
Docent(en)	prof. dr. ir. J. Legler, dr. ir. C.A.M. van Gestel, dr. ir. T.H.M. Hamers
Lesmethode(n)	Hoorcollege, Practicum
Niveau	400

Doel vak

This course in environmental chemistry has the main aim of understanding processes that chemicals undergo in the environment. The course is taught at the UvA. It can be followed together with the course Environmental Chemistry and Toxicology I, which focuses on environmental toxicology.

Inhoud vak

This course describes the behaviour and fate of natural and man-made chemicals in water, soil and air and the organisms present therein. Topics include transport and distribution processes, and physico/biochemical reactions of compounds in environment(al conditions); environmental soil chemistry; bioavailability, bioaccumulation, metabolism, and degradation of chemicals; biomonitoring, prediction and fate modelling in environmental compartments; biogeochemical cycles, structure property/activity relationships.

Onderwijsvorm

This course contains a series of lectures, seminars and working classes.
Lectures: 26 hours
Working classes: 4 hours

Toetsvorm

The final mark will be determined by a written exam

Literatuur

Schwarzenbach, Gswend, Imboden. 2003. Environmental Organic Chemistry, Wiley, New York ISBN 0-47135053-2 (hardcover)

Vereiste voorkennis

For more information and to determine if you have sufficient background to take this course, please contact the coordinator

(email:pim.de.voogt@uva.nl)

Doelgroep

Bachelors preferably in Earth Sciences or Chemistry but also Biology or other Natural Sciences may be possible.

This course is open to all Master students with a Biology, Ecology or Chemistry BSc. It is a compulsory course for MSc Ecology – ECT track students and can be followed in combination with ECT I (see AM_1032).

Overige informatie

To take this course, students must register temporarily (bijvakstudent) at the UvA (see course description UvA-site).

External lecturers:

Dr. W.P. de Voogt (UvA)

Dr. J. Parsons (UvA)

prof.dr. R.W.P.M. Laane (Deltares)

Environmental Genomics and Adaptation

Vakcode	AM_470506 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. ir. T.F.M. Roelofs
Examinator	dr. ir. T.F.M. Roelofs
Docent(en)	dr. H. Schat, dr. ir. T.F.M. Roelofs
Lesmethode(n)	Hoorcollege, Computerpracticum, Practicum
Niveau	500

Doel vak

Students will be able to:

- 1 Describe different molecular genetic techniques to study gene expression and genomic variation in response to environmental stimuli.
- 2 Explain how to use these techniques in ecological and physiological research.
- 3 Analyze experimental data generated by genomics research and knowing the possibilities for follow-up research
- 4 Find and analyze genomic data in databases on internet.
- 5 Describe the functional significance of genomic variation for organisms and populations in natural environments.
- 6 Characterize the evolutionary consequences of such variation for species abundance, community diversity, and the evolution of speciation

Inhoud vak

Researchers in ecology and physiology are making extensive use of molecular techniques. Environmental genomics can be applied to advance our understanding of the way organisms functionally respond to changes within their local environment. Such responses may have consequences for species abundance, community diversity, and the evolution of speciation. In this course we will focus on:
Regulation of gene expression. Which genes are turned on in response

to environmental challenge, and what do they do?

Differences in the molecular basis of fitness among individuals.

Is there intraspecific variation in gene expression in response to environmental change, and is this variation adaptive?

Furthermore, we will assess evolutionary consequences of genomic variation. What are the

ecosystem-, community-, and population-level consequences of the molecular transformations in the genome? Does gene family expansion and contraction drive speciation, or does the emergence of new gene bodies and protein domains add to speciation?

We will follow topics covered by chapters in the book 'An

Introduction to Ecological Genomics' and include molecular adaptation to drought, genetic marker development and analytical methods, evolution of metal tolerance, speciation genetics.

Practical training include a Gene expression experiment, designed and executed by the students. Also, a computer exercise on transcriptomics (microarray data) will be performed. These data are extracted from peer-reviewed scientific papers. Finally, a journal club will be organized, in which students present a scientific paper on an Ecological Genomics topic.

The field of ecological genomics moves extremely quickly. Consequently, topics addressed in the accompanying book will be out of date to some extent. In order to address up-to-date and state-of-art knowledge on ecological genomics topics, specialists in this field will be invited to give guest lectures.

Onderwijsvorm

Lectures & Guest Lectures

Seminar (journal club) discussing recent literature on Environmental genomics. Presentation of a scientific paper during this seminar.

Written report summarizing the content of the presented scientific paper.

Practical training regarding gene expression analysis using Q-PCR technology.

Written report of Practical: Introduction, Material & Methods, Results and Discussion.

Computer exercise on transcriptomic data retrieved from public databases. The Limma package in R will be used predominantly. TIGR Mev software will be applied to visualize data output.

Self study

Toetsvorm

Assessment of oral presentation of a research paper by a panel of consisting of course coordinator, junior lecturer and Post-doc.

Standardized forms will be used to retrieve scores for different aspects of the presentation.

Assessment of written reports on QPCR practical and scientific paper
Mean grade of presentation and written reports will make up 25% of the final grade.

Written exam consisting of open questions will make up 70% of final grade. A score of at least 5.5 is required to pass this course.

Literatuur

N. M. van Straalen and D. Roelofs 2011. An Introduction to Ecological Genomics, 2nd edition. Oxford University Press.

Vereiste voorkennis

BSc level course on molecular biology

Doelgroep

MSc students Biology and Ecology from VU and UvA

Intekenprocedure

Standard via VUnet

Environmental Measuring Techn.

Vakcode	AMU_0005 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen

Inhoud vak

This is an UvA course. For the course description, please visit

<http://studiegids.uva.nl/>

Environmental Measuring Techniques

Vakcode	AM_1041-UvA ()
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen

Inhoud vak

This course is offered by the UvA. See for the description:

<http://studiegids.uva.nl/web/uva/sgs/nl/c/7903.html>

Overige informatie

Coordinators: de Voogt / Kalbitz (UvA).

The course description can be found on the UvA website:

http://studiegids.uva.nl/sgs/WebSite_nl.

Course registration via UvA, not VU.

Ethics in Life Sciences

Vakcode	AM_470707 ()
Periode	Periode 3
Credits	3.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. J.T. de Cock Buning
Examinator	prof. dr. J.T. de Cock Buning
Docent(en)	prof. dr. J.T. de Cock Buning, dr. J.F.H. Kupper
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	400

Doel vak

To provide a toolbox of ethical instruments to analyze properly moral problems related (to one's own) research in the life sciences

- To acquire conceptual knowledge of the central concepts in applied philosophy and professional ethics
- To challenge an ethical reflection on one's own life science specialization and to open it for an impartial and constructive discussion
- To exercise a team based project to enter, prepare and execute a moral dialogue
- To acquire the necessary skills to handle ethical issues in an accountable manner, as a professional academic beyond one's own inclinations and prejudgments

Inhoud vak

Researchers in life sciences generate the knowledge that builds the future of our society. Therefore, professional academics should be accountable for their decisions, experimental designs and presentation of results. In this short course, the principles of justification will be illustrated with cases of technology ethics and medical ethics. The way an ethical review committee on animal research works, is simulated by a role play exercise on an actual research protocol. Finally, as a small group training project, an ethical dialogue is prepared and executed together with another team.

Onderwijsvorm

Ethics in the Life Sciences is a fulltime course of four weeks (3 ECTS).

The total study time is 80 hours.

The different elements have the following study time:

- Lectures: 13 hours
- Work groups: 17 hours
- Group assignment: 24 hours
- Exam: 2 hour
- Presentation : 4 hours
- Self working (reading in the first week): 20 hours

Please note that attendance to the work group meetings is compulsory.

Attendance to the lectures is highly recommended. In our experience, relying on self-study alone is insufficient to apply the theory of the lectures in the assignments of the workgroups, and to pass the exam.

Toetsvorm

- Degree of intellectual participation in the workgroups (10%)
- exam (50%) has to be passed
- written and verbal execution of the ethical dialogue (40%)

Literatuur

Available on Blackboard

Vereiste voorkennis

Bsc Biology, Biomedical Sciences, Psychology with profile Biological Psychology or Neuropsychology

Doelgroep

Compulsory course in all FALW Master programmes, except Health Sciences and Neuro Sciences

Overige informatie

Lectures in English, part of the workgroups are in Dutch. All presentations and plenary discussions in English.

In order to maximize the experience of differences in values and preferences, and this increase meaningful ethical inquiry we will place you randomly in the workgroups. Placement will be communicated after the introduction lecture.

Evolution of Species Interaction

Vakcode	AMU_0006 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen

Inhoud vak

This is an UvA course. For the course description, please visit <http://studiegids.uva.nl/>

Evolution of Species Interactions

Vakcode	AM_1017-UvA ()
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Niveau	500

Doel vak

Objectives of the course Evolution of Species Interaction: To analyse phylogenetic patterns of interacting species (endosymbiont-host, plant-pollinator, and insect herbivore-plant associations); to analyse the major traits that maintain these interactions and how these traits evolve; to formulate hypotheses how species interactions evolve and how this might lead to new species. The course focusses on chemical signals in intra- and interspecific communication (chemical ecology).

Inhoud vak

Topics include advanced phylogenetic techniques, phylo-/bio-geography, analysis of (in)congruence between phylogenetic trees of interacting groups of species, character trait evolution, intra- (sex pheromones) and interspecific (secondary plant compounds) chemical communication, evolution of signalling systems (receptor proteins), phylogenetic conservatism in host use, evolution of specialisation (evolutionary dead-end), and sexual selection and speciation models.

Relevant techniques will be demonstrated or practiced in small experiments [e.g., behavioural assays, gas-chromatography (GC), mass spectrometry, electrophysiology (both olfaction and taste recording from insect sensory organs) and coupled GC-electrophysiology to aid the identification of biologically active compounds].

Onderwijsvorm

Discussion of literature & poster (1,5 EC), lectures (3 EC) and practicals/demonstrations (1.5 EC)

Toetsvorm

Written examination (essay) 70%, practicals 20% and attitude 10%

Literatuur

Recommended: Schoonhoven et al (2005). Insect-plant biology, Oxford University Press, Oxford, ISBN 0-19-852958-8

Referencebook: Futuyama, D.J. (2005) Evolution, Sinauer, Sunderland, ISBN 0-087893-187-2

Reader (ca. 10 euro)

Vereiste voorkennis

Bachelor Biology

Overige informatie

Co-ordinator: dr. P. Roessingh

Science Park 904 kamer C2.209

+31 20 5257732

Lecturers: prof. dr. S.B.J. Menken, dr Toby Kiers (VU) and dr. P. Roessingh.

Registration via studieweb (UvA, at least 4 weeks before the start of the semester) and VUnet (VU, at least 4 weeks before the start of the period).

The course schedule will be published on Blackboard and on the website www.student.uva.nl (choose the specific master).

Minimum 4, maximum 24 students.

A supplementary programme for foreign students is available (mandatory for major projects).

Location: Science Park Amsterdam.

Evolutionary Dynamics

Vakcode	AM_1019 ()
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. G.J.J. Driessen
Examinator	dr. G.J.J. Driessen
Niveau	500

Inhoud vak

This course is delivered at the UvA. For more information see this link.

<http://studiegids.uva.nl/web/uva/sgs/en/c/14382.html>

Evolutionary Dynamics

Vakcode	AMU_0007 ()
Periode	Periode 4+5+6
Credits	6.0
Faculteit	Fac. der Aard- en Levenswetenschappen

Inhoud vak

This is an UvA course. For the course description, please visit <http://studiegids.uva.nl/>

Experimental Design and Analysis

Vakcode	AM_470505 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. G.J.J. Driessen
Examinator	dr. G.J.J. Driessen
Docent(en)	dr. G.J.J. Driessen, J. Duivenvoorden, dr. P.H. Vos
Lesmethode(n)	Hoorcollege, Computerpracticum
Niveau	500

Doel vak

The final attainment levels of this course, include that students:

- Are acquainted with possible experimental designs and can select the most suitable design depending on experimental objective and hypothesis
- Are acquainted with possible statistical analyses, understand the theory and the assumptions underlying the various analyses and can test the underlying assumptions
- Can select the most suitable statistical analysis depending on the design chosen and the statistical assumptions
- Can interpret the chain of hypotheses, design and analysis to validate hypotheses on-field-conditions and model behaviour

Inhoud vak

A proper experimental design combined to a suitable statistical analysis is essential to -biological- science, even though it is considered by many as a necessary evil. In this course, the whole chain of hypothesis and design to analysis and interpretation is covered to allow students to apply a range of statistical techniques independently.

The application

and implementation of the techniques (in R) is the basis. Possible experimental designs are discussed in relation to specific biological questions and hypotheses. The application of statistical analysis is treated in relation to these designs. Theory and especially the assumptions underlying the test are treated to the extent that this information is necessary to apply the tests properly. Both -combinations of- regression and analysis of variance techniques and multivariate analysis techniques like unconstrained and constrained ordination and meta analysis are dealt with. Other biological questions like classification issues, working with large datasets, data reduction and multiple response variables are discussed.

Onderwijsvorm

As application is central to this course, case studies, assignments and working with real biological data is the core of this course. Starting of with the research question, hypothesis and the lab/field/model

situation a proper design and statistical analysis will be discussed. A specific case study, explained by the researcher who performed that particular research, is used to illustrate this chain of arguments. Theory, assumptions and tests are all treated in the context of these case studies and are coupled directly to the case study and subsequent assignments. The course is finalised with an extensive case study, to which the theory is applied. This set-up translates into 30 contact hours for lectures, 4 contact hours for a practical on the first assignment and 20 contact hours for feedback on the assignments .

Toetsvorm

Report on the final case study (100%)

Literatuur

Quinn, G.P. and M.J. Keough (2002), Experimental design and data analysis for biologists Cambridge University Press

Dalgaard, P. (2008) Introductory Statistics with R

Logan, M. (2010) Biostatistical Design and Analysis Using R: A Practical Guide. Wiley

Borcard, D., F. Gillet and P. Legendre (2011) Numerical ecology in R. Springer

Bolker, B.M., M.E. Brooks, C.J. Clark, S.W. Geange, J.R. Poulsen, M.H.H. Stevens and J.S. White (2009). Generalized linear mixed models: a practical guide for ecology and evolution. Trends Ecol. Evol. 24: 127-135

Gurevitch, J. and L.V. Hedges (1999) Statistical issues in ecological meta-analyses. Ecology 80: 1142-1149

This literature is complimented by a syllabus, explanations on assignments, answers to the assignments, lecture handouts, background information, background notes on Blackboard.

Vereiste voorkennis

Methodology and statistics 1 and 2 or equivalent statistics courses. This implies that we require students to understand the interpretation of P-values, type I and type II errors and statistical hypotheses testing in general. In addition, students are required to have understanding on t-tests (paired and unpaired), linear regression and one-way ANOVAs.

Doelgroep

The course is compulsory for MSc Ecology students at the VU doing the Ecology and Evolution or the Environmental Chemistry and Toxicology specialization and for UvA students doing the Ecology and Evolution specialization of the master Biological Science. The course is also open for master students in Biology, Ecology or Earth Sciences and PhD students at the VU and UvA universities with a deficiency in experimental design and statistics.

Overige informatie

The course is organized by the Department of Ecological Science at the VU and the Institute for Biodiversity and Ecosystem Dynamics of the UvA. All contact hours are at VU University.

Literature Survey E&E

Vakcode	AM_1131 ()
Periode	Ac. Jaar (september)
Credits	12.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. G.J.J. Driessen
Examinator	dr. G.J.J. Driessen

Doel vak

For master students in Ecology and Evolution it is required to carry out a thesis based on a literature survey (12 ec). The aim is to demonstrate the ability to efficiently process material in a given field and evaluating this critically.

IMPORTANT: A extensive manual containing the forms and a description of all procedures and requirements of the literature thesis Ecology and Evolution can be found on:

<http://www.falw.vu.nl/nl/onderzoek/ecological-sciences/internships-at-the-institute/index.asp>

Inhoud vak

The literature survey can focus on a fundamental ecological question but may also take a more applied ecological approach. The topic and research question are free of choice.

Prior to participating in any thesis or literature survey, both student and faculty staff member and external supervisor (if applicable) involved should fill

out a written application and agreement form.

This form (and others) can also be downloaded from:

<http://www.falw.vu.nl/nl/onderzoek/ecological-sciences/internships-at-the-institute/index.asp>

Onderwijsvorm

Every literature survey has to be approved by the master coordinator in advance (on behalf of the examination board). Therefore you should hand in a proposal that you have discussed with the faculty staff member and/or external supervisor.

Consult the manual for the literature survey for further details concerning writing of the proposal and the thesis.

Toetsvorm

At the end of the literature survey the student gives an oral presentation of the work in the Department of Ecology. The work and presentation will be assessed by the VU supervisor in consultation with the external supervisor, if applicable.

Literature theses will be assessed according to the following categories:

A. Execution (25%)

- B. Thesis (50%)
- C. Oral Presentation (25%)

Literatuur

Selected papers

Doelgroep

Students in MSc Ecology specialization Ecology and Evolution

Overige informatie

In order to successfully start up and complete the literature thesis it is of major importance to read carefully the manual on:

<http://www.falw.vu.nl/nl/onderzoek/ecological-sciences/internships-at-the-institute/index.asp>

Literature Survey ECT

Vakcode	AM_1132 ()
Periode	Periode 4+5+6
Credits	12.0
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. ir. J. Legler
Examinator	prof. dr. ir. J. Legler

Doel vak

For master students in Environmental Chemistry and Toxicology, it is required to carry out a thesis based on a literature survey (12 ec). The aim is to demonstrate the ability to efficiently process material in a given field and evaluate this critically.

IMPORTANT: A extensive manual containing the forms and a description of all procedures and requirements of the literature thesis in the MSc Ecology programme can be found on:

<http://www.falw.vu.nl/nl/onderzoek/ecological-sciences/internships-at-the-institute/index.asp>

Inhoud vak

The literature survey can focus on a fundamental question in environmental chemistry and/or environmental toxicology but may also take a more applied approach. The topic and research question are free of choice, but should be discussed before starting with the programme coordinator (see below).

Prior to participating in any thesis or literature survey, both student and faculty staff member and external supervisor (if applicable) involved should fill out a written application and agreement form.

This form (and others) can also be downloaded from:

<http://www.falw.vu.nl/nl/onderzoek/ecological-sciences/internships-at-the-institute/index.asp>

Onderwijsvorm

Every literature survey has to be approved by the master coordinator in advance (on behalf of the examination board). Therefore you should hand in a proposal that you have discussed with the faculty staff member and/or external supervisor.

Consult the manual for the literature survey for further details concerning writing of the proposal and the thesis.

Toetsvorm

At the end of the literature survey the student gives an oral presentation of the work at the Institute for Environmental Studies. The work and presentation will be assessed by the VU supervisor in consultation with the external supervisor, if applicable.

Literature theses will be assessed according to the following categories:

- A. Execution (25%)
- B. Thesis (50%)
- C. Oral Presentation (25%)

Literatuur

Selected papers

Doelgroep

Students in MSc Ecology specialization Environmental Chemistry and Toxicology

Intekenprocedure

In order to successfully start up and complete the literature thesis it is of major importance to read carefully the manual at:

<http://www.falw.vu.nl/nl/onderzoek/ecological-sciences/internships-at-the-institute/index.asp>

Overige informatie

For more information, contact the MSc Ecology - ECT coordinator Prof.dr.ir Juliette Legler, room A645, tel 020 5989516, Juliette.legler@vu.nl

Mass Spectrometry

Vakcode	X_435604 (435604)
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Niveau	400

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2014-2015/zoek-vak/vak/229>

Overige informatie

Registration via <https://www.sis.uva.nl> is mandatory 4 weeks before the start of the Semester.

Masterclasses in Ecology and Evolution

Vakcode	AM_1016 ()
Periode	Ac. Jaar (september)
Credits	3.0

Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. J. Ellers
Examinator	prof. dr. J. Ellers
Lesmethode(n)	Hoorcollege, Werkcollege
Niveau	400

Doel vak

To obtain a broad overview of the latest research in ecology and evolution

- To learn to critically evaluate scientific research articles
- To practice skills of scientific argumentation and discussion
- Learning to discuss these topics with leading scientists in the field

Inhoud vak

Being able to participate in discussion is an important skill for scientists. It requires the ability to combine theoretical and empirical knowledge as well as a critical view on the arguments put forward by others. The best way to improve these skills is to practice them under supervision of senior scientists. In this course students are trained to discuss the important topics in Ecology and Evolution with top scientists in the world, in the form of a masterclass (described below). In doing so, students will attend seminars from these internationally renowned scientists in the Nature of Life meetings organized by the Institute of Ecological Sciences (VU) and in the series of IBED lectures organized by the Institute for Biodiversity and Ecosystem Dynamics (UvA). Both series are organized on a monthly basis throughout the year (except the summer period). The topics for the seminars cover the whole spectrum of ecology and evolution. An overview of upcoming and previous seminars can be found at www.falw.vu.nl/nl/onderzoek/ecological-sciences/nature-of-life-meetings/index.asp and www.science.uva.nl/ibed-agenda/see.cfm. Students must attend six masterclasses during the 2-year programme. Students may attend more theme lectures on a facultative basis, subject to availability.

Onderwijsvorm

In preparation for each masterclass, several recent papers by the guest speaker will be studied and extensively discussed during a tutorial meeting with staff members of the Institute of Ecological Sciences or of the Institute for Biodiversity and Ecosystem Dynamics. Students then participate in a discussion meeting with the speaker (the actual masterclass), and finally they attend the seminar as part of the course. Students are required to participate actively in the discussion during the tutorials, masterclass and the seminar. The total number of contact hours (including lectures and discussions) is 30, the remaining time is spent on preparation.

Toetsvorm

Factors which count for the final grade:

For each masterclass: active participation, theoretical insight, and argumentation of the students in the tutorial meeting, masterclass and seminar: 100%

Students pass after 6 satisfactorily participated masterclasses.

Literatuur

Primary literature and recent articles by the guest speakers, to be announced at least one week before each masterclass.

Vereiste voorkennis

BSc Biology from a Dutch University. Students with a BSc in Earth Sciences, Social Geography, Beta/Gamma, and international BA's with Nuffic accreditation can be admitted, but extra elements can be obligatory.

Doelgroep

Master students in Biology and Ecology (from both the Ecology and Evolution as well as the Environmental Chemistry and Toxicology specializations) at the VU and master students from the Biological Sciences specialization Ecology and Evolution at the UvA.

Overige informatie

Location: VU University Amsterdam, De Boelelaan 1085 Amsterdam and University of Amsterdam, Science Park 904 Amsterdam

Microbial Ecology

Vakcode	AMU_0008 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen

Inhoud vak

This is an UvA course. For the course description, please visit <http://studiegids.uva.nl/>

Research Project Ecology and Evolution 1

Vakcode	AM_1100 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. G.J.J. Driessen
Examinator	dr. G.J.J. Driessen
Niveau	600

Doel vak

The aims of the master's placement are:

- The student learns to independently conduct scientific research.
- The student is able to independently find scientific information and to evaluate this for the benefit of his or her own research question.
- The student is able to apply scientific methods and knowledge, to answer research questions and to generate evidencebased knowledge.
- The student is able to formulate a research question, to choose, to implement and to evaluate the (appropriate) research method, and to phrase the obtained results in a scientific report.
- The student is able to cooperate with researchers of various

disciplines.

- The student is able to write a scientific report of the research on the level of peer-reviewed academic journals.
- The student is able to orally present the research results and to discuss the findings.
- The student obtains a good impression of a potential future field of career.

Inhoud vak

The two research projects in the Ecology and Evolution programme serve to get students acquainted and experienced with the practice of ecological research. Both research projects should thus reside in Ecology. If you have 12 ec in elective courses in your programme both research projects together will have to amount up to 75 ec. If you have 18 ec in elective courses the total study load is 69 ec. The shortest project should at least be 30 ec.

The first research project during your MSc Ecology and Evolution must take place at the Department of Ecological Science at the VU, or at the Institute for Bioversity and Ecosystem Dynamics at the UvA.

For research projects at the Ecology department of the VU check the website:

www.falw.vu.nl/nl/onderzoek/ecological-sciences/internships-at-the-institute.

If you want to do a project outside the VU you may look for internships at the websites of other Dutch universities or research institutes, for example: NIOO (fundamental ecological research), NIOZ (marine ecology), ALTErrA (applied and environmental ecology), RIVM (applied and environmental ecology), SOVON (avian ecology), but also at the sites of nature conservation organisations such as Natuurmonumenten, Staatsbosbeheer, or regional authorities (Provincie and Waterschap).

However, organisations for the conservation of specific species (f.e. butterflies, dolphins, tigers, primates, etc.) will generally not be qualified enough. Research projects/internships in commercial companies are generally also not accepted, since commercial and educational interests often are quite different. Projects at universities or research institutes outside the Netherlands can also be accepted provided they are of sufficient academic quality.

In all cases: take care that you will be working on an ecological research question and that you will be able to collect enough reliable data to write a scientific report in the end. Purely monitoring or inventory projects are not of a masters' level and will not be allowed.

Onderwijsvorm

A Placement Manual for Research Projects in the MSc Ecology can be obtained at:

<http://www.falw.vu.nl/nl/onderzoek/ecological-sciences/internships-at-the-institute/index.asp>

This document contains the protocols, guidelines for proposals and reports and application and assessment forms, etc. needed to successfully complete a research project.

IT IS VERY IMPORTANT to read this document carefully in order to avoid unpleasant experiences during the progress of the placement. Every research project or literature study has to be approved by the master

coordinator in advance.

Toetsvorm

At the end of the project a scientific report of the work has to be written in English an oral presentation has to be given also in English. The final grade will be determined by the VU supervisor and VU second assessor in consultation with the external supervisor, if applicable. It is based on the following categories: attitude (pass/fail), execution (20%), presentation (20%) and report (60%).

Literatuur

Selected papers

Vereiste voorkennis

You are not allowed to start a research project before having obtained already 18 ec in master courses.

Doelgroep

MSc Ecology specialization Ecology and Evolution

Intekenprocedure

See placement manual at:

<http://www.falw.vu.nl/nl/onderzoek/ecological-sciences/internships-at-the-institute/index.asp>

Overige informatie

The Placement Manual for Research Projects in the MSc Ecology can be obtained at:

<http://www.falw.vu.nl/nl/onderzoek/ecological-sciences/internships-at-the-institute/index.asp>

Research Project Ecology and Evolution II

Vakcode	AM_1114 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. G.J.J. Driessen
Examinator	dr. G.J.J. Driessen
Niveau	600

Doel vak

The aims of the master's placement are:

- The student learns to independently conduct scientific research.
- The student is able to independently find scientific information and to evaluate this for the benefit of his or her own research question.
- The student is able to apply scientific methods and knowledge, to answer research questions and to generate evidencebased knowledge.
- The student is able to formulate a research question, to choose, to implement and to evaluate the (appropriate) research method, and to phrase the obtained results in a scientific report.
- The student is able to cooperate with researchers of various disciplines.
- The student is able to write a scientific report of the research on

the level of peer-reviewed academic journals.

- The student is able to orally present the research results and to discuss the findings.
- The student obtains a good impression of a potential future field of career.

Inhoud vak

The two research projects in the Ecology and Evolution programme serve to get students acquainted and experienced with the practice of ecological research. Both research projects should thus reside in Ecology. If you have 12 ec in elective courses in your programme both research projects together will have to amount up to 75 ec. If you have 18 ec in elective courses the total study load is 69 ec. The shortest project should at least be 30 ec.

The first research project during your MSc Ecology and Evolution must take place at the Department of Ecological Science at the VU, or at the Institute for Biodiversity and Ecosystem Dynamics at the UvA.

For research projects at the Ecology department of the VU check the website:

www.falw.vu.nl/nl/onderzoek/ecological-sciences/internships-at-the-institute.

If you want to do a project outside the VU you may look for internships at the websites of other Dutch universities or research institutes, for example: NIOO (fundamental ecological research), NIOZ (marine ecology), ALTEERRA (applied and environmental ecology), RIVM (applied and environmental ecology), SOVON (avian ecology), but also at the sites of nature conservation organisations such as Natuurmonumenten, Staatsbosbeheer, or regional authorities (Provincie and Waterschap).

However, organisations for the conservation of specific species (f.e. butterflies, dolphins, tigers, primates, etc.) will generally not be qualified enough. Research projects/internships in commercial companies are generally also not accepted, since commercial and educational interests often are quite different. Projects at universities or research institutes outside the Netherlands can also be accepted provided they are of sufficient academic quality.

In all cases: take care that you will be working on an ecological research question and that you will be able to collect enough reliable data to write a scientific report in the end. Purely monitoring or inventory projects are not of a masters' level and will not be allowed.

Onderwijsvorm

A Placement Manual for Research Projects in the MSc Ecology can be obtained at:

<http://www.falw.vu.nl/nl/onderzoek/ecological-sciences/internships-at-the-institute/index.asp>

This document contains the protocols, guidelines for proposals and reports and application and assessment forms, etc. needed to successfully complete a research project.

IT IS VERY IMPORTANT to read this document carefully in order to avoid unpleasant experiences during the progress of the placement. Every research project or literature study has to be approved by the master coordinator in advance.

Toetsvorm

At the end of the project a scientific report of the work has to be written in English an oral presentation has to be given also in English. The final grade will be determined by the VU supervisor and VU second assessor in consultation with the external supervisor, if applicable. It is based on the following categories: attitude (pass/fail), execution (20%), presentation (20%) and report (60%).

Literatuur

Selected papers

Vereiste voorkennis

You are not allowed to start a research project before having obtained already 18 ec in master courses.

Doelgroep

MSc Ecology specialization Ecology and Evolution

Intekenprocedure

See Placement Manual at:

<http://www.falw.vu.nl/nl/onderzoek/ecological-sciences/internships-at-the-institute/index.asp>

Overige informatie

The Placement Manual for Research Projects in the MSc Ecology can be obtained at:

<http://www.falw.vu.nl/nl/onderzoek/ecological-sciences/internships-at-the-institute/index.asp>

Research Project Environmental Chemistry and Toxicology I

Vakcode	AM_1108 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. ir. J. Legler
Examinator	prof. dr. ir. J. Legler
Niveau	600

Doel vak

The aims of the master's placement are:

- The student learns to independently conduct scientific research.
- The student is able to independently find scientific information and to evaluate this for the benefit of his or her own research question.
- The student is able to apply scientific methods and knowledge, to answer research questions and to generate evidencebased knowledge.
- The student is able to formulate a research question, to choose, to implement and to evaluate the (appropriate) research method, and to phrase the obtained results in a scientific report.
- The student is able to cooperate with researchers of various disciplines.
- The student is able to write a scientific report of the research

on the level of peer-reviewed academic journals.

- The student is able to orally present the research results and to discuss the findings.
- The student obtains a good impression of a potential future field of career.

Inhoud vak

The two research projects in the MSc Environmental Chemistry and Toxicology specialization serve to get students acquainted and experienced with the practice of research in environmental chemistry and environmental toxicology. Students are required to do one research project in environmental chemistry (AM_1108), and one in environmental toxicology (AM_1113). Each research project is 30 Ec. One of the projects may be extended by 6 Ec by substituting an elective course. The first research project during your MSc Ecology – ECT must take place at the Institute for Environmental Studies or Department of Ecological Sciences at the VU, or at the Institute for Biodiversity and Ecosystem Dynamics at the UvA.

For research projects at the VU, contact the coordinator or check the website:

www.falw.vu.nl/nl/onderzoek/ecological-sciences/internships-at-the-institute.

If you would like to do a project outside the VU you may look for internships at the websites of other Dutch universities or research institutes, for example: KWR or Waternet (applied water research), NIOO (fundamental ecological research), NIOZ (marine ecology), IMARES (fisheries and sea research), ALTErrA (applied and environmental ecology), RIVM (applied and environmental ecology), Deltares (applied environmental sciences), but also at the sites of nature conservation organisations such as Natuurmonumenten, Staatsbosbeheer, or regional authorities (Provincie and Waterschap). Projects at universities or research institutes outside the Netherlands can also be accepted provided they are of sufficient academic quality.

In all cases: take care that you will be working on either an environmental chemistry or environmental toxicology research question and that you will be able to collect enough reliable data to write a scientific report in the end. Purely monitoring or inventory projects will not be allowed.

Onderwijsvorm

A Placement Manual for Research Projects in the MSc Ecology can be obtained from the master coordinator (g.j.j.driessen@vu.nl). This document contains the protocols, guidelines for proposals and reports and application and assessment forms, etc. needed to successfully complete a research project. It is very important to read this document carefully in order to avoid unpleasant experiences during the progress of the placement. Every research project or literature study has to be approved by the master coordinator in advance.

Toetsvorm

At the end of the project a scientific report of the work has to be written in English an oral presentation has to be given also in English. The final grade will be based on the following categories: attitude (pass/fail), execution (20%), presentation (20%) and report (60%).

Vereiste voorkennis

You are not allowed to start a research project before having obtained already 18 ec in master courses.

Aanbevolen voorkennis

The MSc course Experimental Design and Analysis (AM_470505) is strongly recommended.

Doelgroep

MSc Ecology - ECT students

Overige informatie

For more information, please contact: Prof. dr. ir J. Legler, Room A-645, 020-5989516, juliette.legler@vu.nl

Research Project Environmental Chemistry and Toxicology II

Vakcode	AM_1113 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. ir. J. Legler
Examinator	prof. dr. ir. J. Legler
Niveau	600

Doel vak

The aims of the master's placement are:

- The student learns to independently conduct scientific research.
- The student is able to independently find scientific information and to evaluate this for the benefit of his or her own research question.
- The student is able to apply scientific methods and knowledge, to answer research questions and to generate evidencebased knowledge.
- The student is able to formulate a research question, to choose, to implement and to evaluate the (appropriate) research method, and to phrase the obtained results in a scientific report.
- The student is able to cooperate with researchers of various disciplines.
- The student is able to write a scientific report of the research on the level of peer-reviewed academic journals.
- The student is able to orally present the research results and to discuss the findings.
- The student obtains a good impression of a potential future field of career.

Inhoud vak

The two research projects in the MSc Environmental Chemistry and Toxicology specialization serve to get students acquainted and experienced with the practice of research in environmental chemistry and environmental toxicology. Students are required to do one research project in environmental chemistry (AM_1108), and one in environmental toxicology (AM_1113). Each research projects is 30 Ec. One of the projects may be extended by 6 Ec by substituting an elective course. The first research project during your MSc Ecology – ECT must take place at the Institute for Environmental Studies or Department of Ecological Sciences at the VU, or at the Institute for Biodiversity and Ecosystem Dynamics at the UvA.

For research projects at the VU, contact the coordinator or check the website:

www.falw.vu.nl/nl/onderzoek/ecological-sciences/internships-at-the-institute.

If you would like to do a project outside the VU you may look for internships at the websites of other Dutch universities or research institutes, for example: KWR or Waternet (applied water research), NIOO (fundamental ecological research), NIOZ (marine ecology), IMARES (fisheries and sea research), ALTERRA (applied and environmental ecology), RIVM (applied and environmental ecology), Deltares (applied environmental sciences), but also at the sites of nature conservation organisations such as Natuurmonumenten, Staatsbosbeheer, or regional authorities (Provincie and Waterschap). Projects at universities or research institutes outside the Netherlands can also be accepted provided they are of sufficient academic quality.

In all cases: take care that you will be working on either an environmental chemistry or environmental toxicology research question and that you will be able to collect enough reliable data to write a scientific report in the end. Purely monitoring or inventory projects will not be allowed.

Onderwijsvorm

A Placement Manual for Research Projects in the MSc Ecology can be obtained from the master coordinator (g.j.j.driessen@vu.nl). This document contains the protocols, guidelines for proposals and reports and application and assessment forms, etc. needed to successfully complete a research project. It is very important to read this document carefully in order to avoid unpleasant experiences during the progress of the placement. Every research project or literature study has to be approved by the master coordinator in advance.

Toetsvorm

At the end of the project a scientific report of the work has to be written in English an oral presentation has to be given also in English. The final grade will be based on the following categories: attitude (pass/fail), execution (20%), presentation (20%) and report (60%).

Vereiste voorkennis

You are not allowed to start a research project before having obtained already 18 ec in master courses.

Aanbevolen voorkennis

The MSc course Experimental Design and Analysis (AM_470505) is strongly recommended.

Doelgroep

MSc Ecology - ECT students

Overige informatie

For more information, please contact: Prof. dr. ir J. Legler, Room A-645, 020-5989516, juliette.legler@vu.nl

Scientific Writing in English

Vakcode	AM_471023 ()
Periode	Ac. Jaar (september)

Credits	3.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	M. van den Hoorn
Lesmethode(n)	Werkgroep
Niveau	400

Doel vak

The aim of this course is to provide Master's students with the essential linguistic know-how for writing a scientific article in English that is well organized idiomatically and stylistically appropriate and grammatically correct.

At the end of the course students

- know how to structure a scientific article;
- know what the information elements are in parts of their scientific article;
- know how to produce clear and well-structured texts on complex subjects;
- know how to cite sources effectively;
- know how to write well-structured and coherent paragraphs;
- know how to construct effective sentences;
- know what collocations are and how to use them appropriately;
- know how to adopt the right style (formal style, cohesive style, conciseness, hedging)
- know how to avoid the pitfalls of English grammar;
- know how to use punctuation marks correctly;
- know what their own strengths and weaknesses are in writing;
- know how to give effective peer feedback.

Final texts may contain occasional spelling, grammatical or word choice errors, but these will not distract from the general effectiveness of the text.

Inhoud vak

The course will start with a general introduction to scientific writing in English. Taking a top-down approach, we will then analyse the structure of a scientific article in more detail. As we examine each section of an article, we will peel back the layers and discover how paragraphs are structured, what tools are available to ensure coherence within and among paragraphs, how to write effective and grammatically correct sentences and how to choose words carefully and use them effectively.

Topics addressed during the course include the following:

- Structuring a scientific article
- Considering reading strategies: who is your readership? How do they read your text? What do they expect? How does that affect your writing?
- Writing well-structured and coherent paragraphs
- Composing effective sentences (sophisticated word order, information distribution).
- Arguing convincingly – avoiding logical fallacies
- Academic tone and style: hedging – why, how, where?
- Using the passive effectively
- Understanding grammar (tenses, word order, etc.)
- Understanding punctuation

- Referring to sources: summarising, paraphrasing, quoting (how and when?)
- Avoiding plagiarism
- Vocabulary development: using appropriate vocabulary and collocations

Onderwijsvorm

Scientific Writing in English is an eight-week course and consists of 4 contact hours during the first week and 2 contact hours a week for the rest of the course. Students are required to spend at least 6 to 8 hours of homework per week. They will work through a phased series of exercises that conclude with the requirement to write several text parts (Introduction, Methods or Results section, Discussion and Abstract). Feedback on the writing assignments is given by the course teacher and by peers.

Toetsvorm

Students will receive the three course credits when they meet the following requirements:

- Students hand in three writing assignments (Introduction, Methods or Results, Discussion) and get a pass mark for all writing assignments;
- Students provide elaborate peer feedback;
- Students attend all sessions;
- Students are well prepared for each session (i.e. do all homework assignments);
- Students actively participate in class;
- Students do not plagiarise or self-plagiarise.

Literatuur

Effective Scientific Writing: An Advanced Learner's guide to Better English (A. Bolt & W. Bruins, ISBN 978 90 8659 6171). VU bookstore: €27.95.

Intekenprocedure

General enrollment information:

The registration for this course consists of two steps:

- (1) Students should register for the course through VUnet;
- (2) After the VUnet registration, students should register for a specific Blackboard group.

Each master programme has one or more designated groups. This designated group offers the best option for the student in terms of study load and schedule. Each semester, one or more open/general groups take place (with a minimum of 18 participants), for which students may register instead of the designated group for their master programme, for example in case of schedule difficulties or because they have to re-sit the course. Students are advised to consult their schedule carefully, since overlap may occur.

Important: Each group has a minimum of 18 and maximum of 24 participants, so students should register on time to ensure a place in one of the (designated) groups.

Please note that even though the VUnet registration is a requirement for the course, only a Blackboard registration in the appropriate group will give you access to the sessions of the course. You will be expected to attend all sessions in the group for which you have a Blackboard registration.

Instructions for Blackboard enrollment:

- An overview of all SWiE groups for the academic year 2014 - 2015 is available under "Course Documents".
- On rooster.vu.nl, the schedule for each group (time and room) can be found under the course name (also available under "Course Documents").
- Based on the group overview and the schedule, please check which one of the designated groups for your master programme you prefer (please check if the course does not coincide with other (elective) courses).
- Go to "Group enroll" and select your master programme.
- Enroll in the group you have selected.

Separation Sciences

Vakcode	X_435609 (435609)
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H. Lingeman
Examinator	dr. H. Lingeman
Docent(en)	dr. H. Lingeman
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak

Getting acquainted with the theory and practice of the main techniques in modern analytical separation science.

Inhoud vak

The topics discussed comprise the fundamentals, theory and practice of gas chromatography, the various modes of liquid chromatography, capillary-based electrophoretic approaches as well as the hyphenation of the various separation systems with mass spectrometry and other sensitive and selective detection devices.

Onderwijsvorm

Lectures and tutorials. Students have to summarize and present an (assigned) recent article on separation science.

Toetsvorm

Written examination and a mark for the article presentation.

Literatuur

Hands-outs (electronically available).

Vereiste voorkennis

Basic knowledge of biochemistry, chromatography, electrophoresis and mass spectrometry.

Aanbevolen voorkennis

Basic knowledge of biochemistry, chromatography, electrophoresis and mass spectrometry.

Doelgroep

Soil-Plant-Animal Interactions

Vakcode	AM_470507 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. M.P. Berg
Examinator	prof. dr. M.P. Berg
Docent(en)	prof. dr. M.A.P.A. Aerts, ing. R.S.P. van Logtestijn, prof. dr. J.H.C. Cornelissen, prof. dr. H.A. Verhoef, prof. dr. M.P. Berg
Lesmethode(n)	Hoorcollege, Practicum, Werkgroep, Excursie, Veldwerk
Niveau	500

Doel vak

Students will be able to:

- Underpin the importance of ecological interactions (trophic and non-trophic) between soil organisms-plants-aboveground fauna (and vice versa)
- Critically evaluate and investigate the relevant interactions between soil-soil organisms, soil-vegetation, soil organisms-vegetation, vegetation-herbivores (and vice versa)
- Critically evaluate and investigate the relevant functional traits that underlie ecological interactions between the soil-subsystem (brown web) and plant-subsystem (green web)
- In the field: apply different techniques to survey the soil-subsystem and plant-subsystem, and to sample soil and soil organisms
- In the laboratory: carry out ecological and biochemical analyses relevant to brown-green web interactions, with emphasis on organismal traits.

Inhoud vak

A hot theoretical topic in Ecology concerns the interdependency of the brown web (belowground) and green web (aboveground) compartments. This comprises key conceptual issues relating to interactions between brown and green communities, the importance of functional traits to understand these interactions within and between these communities, and the processes carried out by each component. These concepts can be applied to current critical questions, such as the regulation and function of biodiversity, vegetation development, and consequences of human-induced global change, e.g. biological invasions, extinctions, nitrogen deposition, land use change and climate change.

In this course we will focus theoretically on the following subjects:

- The brown and green food web: biotic interactions and regulators
- Plant species and plant trait control of brown web interactions and processes
- Belowground consequences of green food web interactions
- Completing the circle: how brown web effects are manifested aboveground
- The regulation and function of biological diversity, with a focus on functional traits of plants, animals and microbes

- Global change phenomena in an aboveground-belowground context
 These subjects are discussed in various papers (see literature) that will be used as the basic literature for the seminars given by the (guest) lecturers. In the second week, students will perform experiments on location (in Zevenaar, The Netherlands) where brown-green web interactions in subarctic ecosystems are currently being studied, with emphasis on (a) design and statistical treatment of experiments on soil-plant-fauna interactions, (b) techniques to identify soil organisms and analyse soil processes, biochemistry and vegetation development.

Onderwijsvorm

Individual performance in critical group discussions about important theory based on these papers/chapters, a preliminary presentation about the own research project, and a final presentation about background, design and (synthesis of) results of own research project.

Toetsvorm

Individual performance in critical group discussions about important theory based on these papers/chapters, a preliminary presentation about the own research project, and a final presentation about background, design and (synthesis of) results of own research project.

Literatuur

Selected literature will be made available via BB, which includes recent key papers in international journals and extracts from Richard D. Bardgett and David A. Wardle (2010): "Aboveground-Belowground Linkages; Biotic interactions, ecosystem processes, and global change". Oxford Series in Ecology and Evolution.

Vereiste voorkennis

To attend this course there will be costs involved. A part of the expenses for accommodation at Zevenaar have to be covered by the MSc-students themselves.

Doelgroep

MSc students with focus on ecology.

Spatial Processes in Ecology

Vakcode	AMU_0009 ()
Periode	Periode 1
Credits	6.0
Faculteit	Fac. der Aard- en Levenswetenschappen

Inhoud vak

This is an UvA course. For the course description, please visit <http://studiegids.uva.nl/>

Spatial Processes in Ecology and Evolution

Vakcode	AM_1039-UvA ()
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen

Inhoud vak

This course is offered by the UvA. See for the course description:

<http://studiegids.uva.nl/web/uva/sgs/nl/c/8773.html>

Overige informatie

Coordinator: M. Boerlijst (UvA).

The course description can be found on the UvA website:

http://studiegids.uva.nl/sgs/WebSite_nl.

Course registration via UvA, not VU.