



Biology MSc

Vrije Universiteit Amsterdam - Fac. der Aard- en Levenswetenschappen - M Biology - 2013-2014

The aim of the programme is to equip the student with the knowledge, skills and understanding required to operate as an independent professional within the disciplines covered by the Master's programme, and to be a suitable candidate for a subsequent career in biological research.

The Master's programme in Biology guarantees its students in-depth research experience with a solid academic basis, combined with the communication skills that are needed to perform at the international level. While the two-year programme is taught in English, some Dutch components are included in the Education specialization.

The student can choose from the following specializations:

Research:

- Brain and Behavior
- Ecology
- Green Life Sciences
- Cell Biology (only applies to students that started 2010-2011 or earlier)

Management, Communication, Education (to be combined with a research specialization):

- Societal specialization (M)
- Communication specialization (C)
- Education specialization (E)

The Societal, Communication and Education specializations are one-year programmes that cannot be combined with each other, and which must be combined with one of the research specializations.

The year schedule 2013 - 2014 can be found at the [FALW-website](#) .

Further information about the MSc programme [Biology](#).

A complete programme description can be found at the [FALW-website](#) .

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Expired programme components Biology

Courses:

Name	Period	Credits	Code
History of Life Sciences	Ac. Year (September), Period 3	3.0	AM_471017
Internship Cell Biology		30.0	AM_471152

MSc Biology, Non-Research Specialisation Programmes

Programme components:

- [Communication Specialisation](#)
- [Biology](#)
- [Societal Specialisation](#)

MSc Biology, Communication Specialisation

Biology is increasingly becoming an interdisciplinary research field in which biological scientists can no longer function effectively in isolation. Rather, they benefit from interaction with other scientists (such as those in the fields of molecular biology, biotechnology and ecology) and societal actors (such as farmers and policy makers, in the field of ecogenomics). Communication about science takes place between academic peers and between scientists and the general public. This makes the Communication specialization a complex and dynamic field of research and practice. The Master's graduate with this specialization has a theoretical understanding of the complex problems that arise during such communication processes, and has developed the necessary skills to act professionally at this interface to enhance communication and the outcomes of communication between scientific actors and society. The programme for the Communication specialization has a study load of 54 EC. While most courses are taught in English, those that focus specifically on the Dutch context and media are taught in Dutch.

Opleidingsdelen:

- [Internship Science Communication](#)
- [Course modules Communication spec.](#)

Internship Science Communication

Students can opt for an internship of 30 credits (EC), or for a combination of an internship of 21 credits and a thesis of 9 credits.

Vakken:

Naam	Periode	Credits	Code
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Internship Communication Specialisation	Ac. Jaar (september)	30.0	AM_471148
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Course modules Communication spec.

Students can opt for a selection of modules from this group. The following modules are compulsory:

- Research Methods (AM_470582)
- Science and Communication (AM_470587)

Vakken:

Naam	Periode	Credits	Code
Communication, Organization and Management	Periode 2	6.0	AM_470572
Qualitative and Quantitative Research Methods	Periode 1	6.0	AM_470582
Science and Communication	Periode 1	6.0	AM_470587
Science in Dialogue	Periode 2	6.0	AM_1002
Science Journalism	Periode 2	6.0	AM_471014
Science Museology	Periode 3	6.0	AM_470590

MSc Biology, Education Specialisation (Dutch)

Courses:

Name	Period	Credits	Code
Internship Education Specialisation	Ac. Year (September)	30.0	AM_471156

MSc Biology, Societal specialisation

Courses:

Name	Period	Credits	Code
Analysis of Governmental Policy	Period 1	6.0	AM_470571
Business Management in Health and Life Sciences	Period 2	6.0	AM_470584
Clinical development and clinical trials	Period 3	6.0	AM_470585
Communication, Organization and Management	Period 2	6.0	AM_470572

Disability and Development	Period 2	6.0	AM_470588
Entrepreneurship in Health and Life Sciences	Period 2	6.0	AM_470575
Health, Globalisation and Human Rights	Period 2	6.0	AM_470818
Internship Societal Specialisation	Ac. Year (September)	30.0	AM_471147
Policy, Politics and Participation	Period 2	6.0	AM_470589
Qualitative and Quantitative Research Methods	Period 1	6.0	AM_470582
Science in Dialogue	Period 2	6.0	AM_1002

MSc Biology, Research Specialisation Programmes

Programme components:

- [Specialisation Brain and Behaviour](#)
- [Specialisation Ecology](#)
- [MSc Biology, spec. Green Life Sciences](#)

MSc Biology, spec. Brain and Behaviour

Programme components:

- [compulsory courses](#)
- [choose at least one of these courses](#)

compulsory courses

Vakken:

Naam	Periode	Credits	Code
Internship Brain and Behaviour	Ac. Jaar (september)	30.0	AM_471151
Methods in Behavioral Neurosciences	Periode 1	6.0	AM_470728
Neurobiology of Animal Behaviour	Periode 1	6.0	AM_471018

choose at least one of these courses

Vakken:

Naam	Periode	Credits	Code
Neuronal Networks in Vivo	Periode 2	6.0	AM_1001

System Neurosciences	Periode 2	6.0	AM_470712
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MSc Biology, spec. Ecology

Programme components:

- [optional modules](#)
- [compulsory course](#)
- [choose at least 2 of these courses](#)

optional modules

Vakken:

Naam	Periode	Credits	Code
Current Trends in Evolution	Periode 1	6.0	AM_1038-UvA
Environmental Genomics and Adaptation	Periode 2	6.0	AM_470506
Evolution of Species Interactions	Ac. Jaar (september)	6.0	AM_1017-UvA
Masterclasses in Ecology and Evolution	Ac. Jaar (september)	3.0	AM_1016
Microbial Ecology	Periode 1	6.0	AM_470511
Spatial Processes in Ecology and Evolution	Periode 1	6.0	AM_1039-UvA

compulsory course

Vakken:

Naam	Periode	Credits	Code
Internship Ecology	Ac. Jaar (september)	30.0	AM_471150

choose at least 2 of these courses

Vakken:

Naam	Periode	Credits	Code
Experimental Design and Analysis	Periode 2	6.0	AM_470505
Soil-Plant-Animal Interactions	Periode 1	6.0	AM_470507
Spatial Ecology and Global Change	Ac. Jaar (september)	6.0	AM_470502

MSc Biology, spec. Green Life Sciences

Programme components:

- [Choose three of these courses](#)

Courses:

Name	Period	Credits	Code
Internship Green Life Sciences	Ac. Year (September)	30.0	AM_1107

Choose three of these courses

Vakken:

Naam	Periode	Credits	Code
Abiotic Stress	Periode 2	6.0	AM_470628
Biotic Interactions	Ac. Jaar (september)	6.0	AM_470627
Developmental Biology	Periode 2	6.0	AM_470613
Plant Breeding and Biotechnology	Ac. Jaar (september)	6.0	AM_470626

MSc Biology, compulsory courses

Vakken:

Naam	Periode	Credits	Code
Ethics in Life Sciences	Periode 3	3.0	AM_470707
Literature Thesis Biology (Research)	Ac. Jaar (september)	9.0	AM_471154
Scientific Writing in English	Ac. Jaar (september)	3.0	AM_471023

Abiotic Stress

Vakcode	AM_470628 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. H. Schat
Niveau	600

Doel vak

Abiotic stresses represent the most limiting factor for agricultural productivity. This course aims to provide the student with general background knowledge and insight in recent progress on how plants sense abiotic stress and the mechanisms they have acquired to deal with it.

Inhoud vak

The course will start with lectures about the specific forms of abiotic stress that plants encounter. These include salinity, drought, heat, cold, and heavy metal stress. Emphasis will be on how plants sense their environment and how perception of external signals is converted into a response at the molecular and physiological levels. Also potential applications for crop improvement will be discussed. Lecture material will be taken from recent reviews and research papers. In the last two weeks, the students will write and present a project proposal on selected subjects

Onderwijsvorm

lectures (12 h), literature study, proposal presentations (8 h)

Toetsvorm

written proposal (70%); oral proposal presentation (30%)

Literatuur

scientific papers (reviews and primary research papers). Titles will be available 4 weeks before the course start.

Vereiste voorkennis

Bachelor Biology, Medical Biology, Biochemistry or equivalent.

Doelgroep

Master students Plant Science and Ecology

Overige informatie

Please note: this course does not take place in 2010 - 2011; only offered every other year.

Analysis of Governmental Policy

Vakcode	AM_470571 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. J.T. de Cock Buning
Docent(en)	prof. dr. J.T. de Cock Buning
Lesmethode(n)	Hoorcollege, Werkgroep, Computerpracticum
Niveau	500

Doel vak

- To acquire critical knowledge regarding different policy models and theories
- To master the correct use of central concepts in political and policy discourses.

- To further deepen your analytic skills with respect to the critical assessment of a complex societal question or dilemma in the health and life science;
- To learn to integrate science- specific knowledge with the knowledge and skills of other disciplines of the social sciences
- To practice skills in data collection and analysis
- To learn to set up valid lines of argumentation;
- To learn to translate research findings into policy recommendations;
- To get experienced in writing a policy advisory report;
- To improve your communication skills;
- To improve your skills in working effectively in a project team, through team building, team analysis and feedback.

Inhoud vak

Governmental policy affects millions of people and is thus object of intensive debate and target of strong societal forces, like political parties, media and interest groups. Being an advisor or policy maker requires a thorough understanding of the dynamics of policy making, as well as from the psychological side as from the more social structures and their influence on a deliberative democracy.

The course contains several lectures on theoretical concepts and models concerning policy analysis. Furthermore you will be challenged, under supervision, to apply and practice these concepts and models in the project assignment. From the very first day, you will be part of a project team of about ten students. You are confronted with a real policy problem from an external commissioning institution (e. g. a non-governmental organization, a Ministry, an advisory council). Within those 4 weeks you will collect data by literature review and interviews and conduct an interdisciplinary analysis on the basis of which you provide an advice. Specific attention is paid to working in a project team and team building. At the end of the course, you prepare an advisory report. On the last day of the course you present the report to the representative of the external institution who commissioned the project. In that presentation your team will highlight the main results of your analysis and defend the recommendations you propose.

Onderwijsvorm

Analysis of Governmental Policy is a fulltime course of four weeks (6 ECTS). The most recent course schedule is to be found on Blackboard. The total study time is 160 hours. Tuition methods include lectures, training workshops, and self-study.

The different elements have the following study time:

- lectures: 15 hours
- project: 147 hours (within the project: 18x 1 hour coach meeting)
- self study: (within the project, defined in the group)
- examination: 2 hours

Please note that attendance to the project meetings is compulsory. Attendance to the lectures is highly recommended. In our experience, relying on self-study alone is insufficient to pass the exam

Toetsvorm

Written exam (25%) and individual evaluation based on personal performance in the project team (50%), and assessment of various group products (report and presentation (25%)). Exam has to be passed successfully.

Literatuur

Buse, Mays and Walt: "Making Health Policy" McGrawHill/Open University press. (at least 2nd edition 2012).

Aanbevolen voorkennis

The project integrates the learned lessons from the first compulsory MPA courses: Qualitative & Quantitative Methods.\

Doelgroep

Compulsory course within the Masterprogramme Management, Policy Analysis and entrepreneurship for the health and life sciences (MPA) and the Societal differentiation of Health, Life and Natural Sciences Masters programmes.

Overige informatie

The case is policy analysis and advice, but the exercised methods and skills are equally applicable to strategic marketing advice or evaluation studies. The teams will be coached by workgroup leaders.

Biotic Interactions

Vakcode	AM_470627 ()
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Niveau	600

Doel vak

This course provides knowledge on recent developments in research on plant-pathogen and plant-insect interactions. This will include the molecular targets and signal transduction pathways involved and the ecological aspects of biotic interactions in nature and in agriculture. With regard to defense against pathogens, the innate immune response and the gene for gene model will be discussed in detail. The role of jasmonate and salicylate in biotic interactions will be discussed. In addition indirect defense modes and the role of secondary metabolites will be illustrated by examples from ongoing research at the University of Amsterdam.

Inhoud vak

The following subjects will be dealt with: Herbivore feeding styles, Pathogenicity modes, compatibility/ incompatibility, Induced defenses, Hypersensitive response and cell death, plant viruses, Pathogenesis related-proteins, Innate Immunity, Elicitors and (a)virulence factors, Resistance-genes, Hormonal signaling, Jasmonate and salicylic acid, Secondary metabolites in plant defense, Indirect defenses: plant volatiles, Tritrophic interactions, Engineered resistance

Onderwijsvorm

Lectures, tutorials, practicals

Toetsvorm

Written exam (60%) oral presentations (40%)

Literatuur

Vereiste voorkennis

BSc Biology, Medical Biology, Biochemistry or equivalent

Overige informatie

Coordinator: dr. R.C. Schuurink (UvA). Lecturers: dr. R. Schuurink, dr. M. Kant, dr. F. Takken, dr. M. Rep, prof. dr. B.J.C Cornelissen (all UvA).

Min. 5, max. 15 students

Business Management in Health and Life Sciences

Vakcode	AM_470584 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. H.J.H.M. Claassen
Docent(en)	prof. dr. H.J.H.M. Claassen
Lesmethode(n)	Hoorcollege, Computerpracticum
Niveau	500

Doel vak

To acquire insight in different legal entities in which to organise a company or enterprise

To get acquainted with:

- financial and legal aspects
- patents and alternative valorization methods
- marketing and sales aspects of businesses

To acquire insight in Human Resource Management models

To get acquainted with different models of financing

To learn to think and act in line with economic and sustainability issues for the company

Inhoud vak

Increasingly, health students will be confronted with a corporate way of thinking in health organisations. To function in such an environment it is critical that students have basic knowledge of fiscal and legal entities and organisational forms of corporate structures (including start-ups). Furthermore, they have to understand what motivates decision makers and financial officers in different companies (also geographical differences). This course comprises a theoretical and a practical part. The theoretical part consists of interactive classes with various experts from the field. Topics that will be dealt with in detail include: intellectual property, portfolio management, finance, risk capital, grants and subsidies, team building and people management, different legal entities, fiscal and legal aspects when starting a new company, SWOT analysis in the life sciences and clinical trials. The practical part consists of bringing the knowledge acquired during the classes into practice in an assignment in which you develop a (personal career) businessplan.

Onderwijsvorm

Lectures:35h
Assignment: 4h
Work on assignment (self study): 40h
Preparing the exam: 81h

Toetsvorm

Written exam: 50%
Personal Business Plan: 50%
Both have to be passed

Literatuur

Will be announced on Blackboard 1 month before the start of the course

Doelgroep

Optional course for Master students Management, Policy Analysis and Entrepreneurship in Health and Life Sciences (MPA), Societal differentiation of the Health, Life & Natural Sciences.

Overige informatie

Guest lecturers/organisations:

- Robert Al, TU Eindhoven
- Tamar Weenen, VU university
- Esther Pronker, VU university
- Patrick de Boer & Jochem Bosschenbroek, Ttopstart BV
- Bart van Weezenbeek
- Bart Bergstein, Forbion Capital partners
- Michael Mellink & Majorie Soeter, Odgersberndtson
- Marga Janse, innovatief LerenLeren BV
- NL Octrooicentrum
- Price Waterhouse Coopers
- AsjesBisseling Belastingadviseurs
- And others to be announced

Clinical development and clinical trials

Vakcode	AM_470585 ()
Periode	Periode 3
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	W.S. Konijn MSc
Docent(en)	prof. dr. H.J.H.M. Claassen
Lesmethode(n)	Hoorcollege, Computerpracticum, Werkgroep
Niveau	500

Doel vak

To acquire knowledge and insight into the role and objectives of drug and clinical development process

To acquire knowledge and insight into the clinical pharmacology in drug development, drug interactions, pharmacodynamic and metabolic interactions

To acquire knowledge and insight into clinical study methodology

To acquire knowledge and skills into the regulatory principles

To acquire knowledge of ICH-GCP and quality

To acquire knowledge and insight into clinical trial coordination

To acquire knowledge and skills into the data management and statistics.

To acquire insight into the ethical aspects

To acquire insight into actual use of clinical trials in R&D strategies

To learn to design a clinical study

To acquire insight into the different epidemiologic study designs

To acquire knowledge and skills into how exposure and disease in a population can be measured and how the relationships between them can be assessed (using SPSS)

To acquire knowledge and skills into interpreting and presenting the results of an epidemiologic study

Inhoud vak

The need for rigorous evaluation of components of health care is increasingly recognised worldwide. An important type of evaluation is the clinical trial. The most commonly performed clinical trials evaluate new drugs, medical devices, biologics, or other interventions on patients in strictly scientifically controlled settings, and are required for regulatory authority approval of new therapies. This course aims to provide students with a theoretical and practical understanding of the issues involved in the design, conduct, analysis and interpretation of clinical trials of health interventions. Furthermore classes are provided on which the actual use of clinical trials in day to day R&D strategies within industry and universities is addressed in detail. Classes include: 'Life Cycle of a Clinical Trial', 'Clinical Trial Methodology', 'ICH-GCP Principles', 'The Ethics Committee', 'Safety Considerations in Clinical Trials', 'Quality Control & Quality Assurance', 'Compliance, Misconduct & Fraud'. An additional week of basic epidemiology will help you to complement the knowledge obtained so far in the course with an understanding of the principles of other types of study designs (cross-sectional, longitudinal, case-control). Issues concerning exposure and disease measurement and exposure-disease relationships will be discussed in detail, and examples will be provided. Together with your colleagues, you will learn how to apply this knowledge first by hand (during the lectures), then to an epidemiologic database (during the computer-based sessions) and how to interpret the results critically.

Onderwijsvorm

Lectures: 25h

(Computer) workgroup: 32h

Preparing the exam: 2h

Toetsvorm

Written exam: 100%

Literatuur

Will be announced on Blackboard 1 month before the start of the course

Doelgroep

Optional course for Master students Management, Policy Analysis and Entrepreneurship in Health and Life Sciences (MPA), Societal differentiation of the Health, Life & Natural Sciences.

Overige informatie

Guest lecturers/organisations:

- Eric Klaver
- DOCS

- Others to be announced

Communication, Organization and Management

Vakcode	AM_470572 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. J. Maas
Docent(en)	dr. H. Wels, prof. dr. F. Scheele, dr. M.B.M. Zweekhorst
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	500

Doel vak

- To get acquainted with theories on organisational behaviour
- To obtain a deeper understanding of communication from the perspective of sharing and influencing results
- To acquire knowledge on organisational structures and designs
- To get acquainted with important theories on organisational transitions and change management
- To acquire insight into different management practices in the health and life sciences sector
- To gain insight in leadership and interpersonal behaviour
- To obtain insight in methods for motivation and conflict management
- To improve communication skills
- To practise analytical and advisory skills

Inhoud vak

Organisations in the health and life science sector are changing fast, a phenomenon driven by newly emerging technologies and increasing societal complexity. A growing number of students with a beta degree will hold professional and managerial functions in these organisations. During this course students will learn how to be effective performers within these environments, both individually and in teams. This requires an understanding of the macro aspects of organisational behaviour, including designing organisations, managerial skills and ways of strategic thinking. Several speakers conduct lectures on aspects as motivation, managing interpersonal behaviour, leadership, communication and developing and changing organisations. The speakers explain theories from literature and relate them to their practical experiences. In addition, the students interview managers in health organisations and analyse these interviews using the newly acquired theoretical concepts. Also, practical cases of health care companies will be analysed and discussed, resulting in advisory reports for management. With the other students you discuss your experiences and a coach helps you relate the experiences to theory.

Onderwijsvorm

Lectures (approximately 22 hours), response lectures (4 hours), self study, training workshops (12 hours), self-study and writing project assignment (approximately 120 hours).

Toetsvorm

Written exam (60%;) and assessment of the interviews, case study analysis, and reports (40%). Grades of both parts must at least be 6 or higher.

Literatuur

To be announced on Blackboard

Doelgroep

Compulsory course within the Master programme Management, Policy Analysis and Entrepreneurship for the Health and Life Sciences (MPA) and the Societal differentiation of Health, Life and Natural Sciences Masters programmes

Overige informatie

Attendance to training, workshops, interviews and discussions is indispensable

Current Trends in Evolution

Vakcode	AM_1038-UvA ()
Periode	Periode 1
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.

Developmental Biology

Vakcode	AM_470613 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. R.E. Koes
Docent(en)	dr. R.F.G. Toonen, dr. ing. E.J. Souer, prof. dr. R.E. Koes
Lesmethode(n)	Hoorcollege
Niveau	600

Doel vak

The development of a single cell, the fertilized egg cell, into a complex organism with all its tissue and organs in the right place is one of the most intriguing phenomena in biology. Whereas disciplines like molecular and cell biology aim to unravel the molecular mechanisms

of a single cell, developmental biology aims to understand how such mechanisms make cells work together in a coherent way to form an entire organism. The overall aim of this course is to provide insight into these molecular mechanisms, such as the regulation of the expression of master genes and cell-to-cell signaling pathways underlying plant and animal development.

Final attainment levels:

- the student has a basic understanding of morphological events that take place during embryogenesis in animals
- the student can describe and distinguish key-concepts in development, such as (i) pattern formation (ii) determination of cell fate, (ii) differentiation and link that to general phenomena known in molecular biology, such as gene regulation, epigenetic phenomena, cell-signalling etc.
- The student can describe the similarities in the development of animals as different as fruitflies and vertebrates, in terms of morphological events and underlying molecular mechanisms.
- The student can explain the paradox that development of organisms with very different morphologies is governed by deeply conserved genes, and understands the molecular evidence for the current ideas.
- The student acquires experience in the critical analysis and discussion of experimental data as presented in research papers and the presentation of such data for a large(r) audience.

Inhoud vak

The first two weeks will be shared with the MSc course Developmental Neurobiology of the vertebrate brain. The first week consists of lectures on general developmental biology. For the second week one of two paths can be chosen: (1) Development of the brain or (2) Plant development. The first part of the course finishes with a written "mid term exam"

In the third and the fourth week the focus shift to specific "hot topics" and research. Three or four masterclasses will be given by invited speakers/researchers that will give an overview of their own research field and discuss their experimental results.

Furthermore, students (couples) will choose 2-3 recent research papers on a hot topic of their interest that they will study in depth to prepare for a small masterclass at the end of week 4 in which they outline the current status of the chosen subject, and present (and critically evaluate) the latest experimental data. Students can freely choose papers on plant or animal development. This ensures that everyone can follow his/her own preference for animal or plant biology and that, in the end, everyone gets a broad view on what is currently going on in (plant or animal) developmental biology.

Specific issues that we will address in the first two weeks are:

- General key-concepts in development, such as pattern formation, segmentation, determination of cell fate, with emphasis on the experimental evidence on which our current knowledge is based
- Research strategies that are widely used in developmental biology.
- Molecular mechanisms that govern the development of embryos in insects (*Drosophila*) and vertebrates
- Elementary aspects of stem cell biology and "reprogramming" of differentiated cells into stem cells
- Evolutionary aspects: how can it be that deeply conserved genes govern the development of organisms with entirely different bodyplans, like fruitflies and vertebrates, or weed plants and trees.

- Late events in embryogenesis, the formation of organs (organogenesis). This will be entirely focused on development of the brain (for students taking the path Brain development)
- Early (embryogenesis) and late events (development of flowers and leaves) in the development of plants. What are similarities and differences with the development of animals?

In the last two weeks we will focus in depth on research concerning particular "topics that are currently "hot" in developmental biology.

Subjects that will be covered by invited speakers are:

- Development and functioning of stem cells and stem cell niches in the intestine.
- Role of Hox genes in the segmentation and later development of vertebrates
- Molecular mechanisms that govern pattern formation in plants

Subjects that will be covered in the masterclasses given by student depends on the choices that are made during the course and are, therefore, not entirely predictable beforehand. Some of the subjects that will almost certainly be covered are:

- Reprogramming of differentiated cells into stems cells and dangers/possibilities for use of such cells in therapy
- Intercellular movement of proteins like transcription factors, which were hitherto always believed to act only in the cells where they are synthesised

Onderwijsvorm

Lectures and masterclasses (~ 58 hrs).

Self study (~ 55 hrs)

Toetsvorm

Written exam (50%)

Oral presentations and (written) abstract (40%)

Active participation to discussions during masterclasses (10%)

Literatuur

There is no specific handbook. You might find it useful to consult, on occasion, a handbook (any) to refresh your memory on some basic cellular processes, like gene regulation, signaling and so on, if that is necessary.

Handouts, incl. PowerPoint files of lectures, pdf files of relevant review and research papers will be provided via the Blackboard site.

Vereiste voorkennis

Basic knowledge (level 1/2) of molecular biology in particular mechanisms underlying regulation of gene expression, cell-signalling. General affection for molecular biology is recommended

Doelgroep

Master students: Biomolecular Sciences, Biology, Biomedical Sciences

Disability and Development

Vakcode	AM_470588 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen

Coördinator	dr. W.H. van Brakel MD
Docent(en)	H.B. Miranda Galarza MSc, F.M. Budge MSc
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	500

Doel vak

- To develop an understanding of disability and the issues faced by people with disabilities
- To develop knowledge and skills for disability research, policy development and management related to disability, rehabilitation and development
- To acquire insight into the epidemiology of disability, with separate attention for important determinants like gender, poverty and HIV/AIDS
- To learn how to use relevant models of disability and the conceptual framework of the International Classification of Functioning, Disability and Health (ICF)
- To understand the importance of human rights in relation to disability and to learn to use the UN Convention for the Rights of Persons with Disabilities for advocacy and other rights-based interventions
- To acquire skills and knowledge in measurement and research methods relevant to disability
- To understand the importance of inter-sectoral collaboration
- To gain insight in participatory approaches

Inhoud vak

The Disability and Development (D&D) course focuses on a broad range of issues related to disability and rehabilitation in the context of development. This means that the focus is on people with disabilities in low and middle-income countries. Disability affects an estimated 1 billion people worldwide, the majority of whom live in low and middle-income countries. The large majority are poor and have no access to rehabilitation services; neither are facilities in place to allow them to be included in the mainstream of society.

To date, very few services and programmes are available to address these needs. The realisation that the Millennium Development Goals cannot be met without addressing the needs of people with disability has brought a new impetus to the field of disability and development. Another major recent development was the adoption of the UN Convention on the Rights of Persons with Disabilities in December 2006. It is expected that there will be a substantial increase in demand for training of a large variety of professionals (e.g. researchers, managers, architects, lawyers, health professionals) with formal training and qualifications in the field of disability-inclusive development.

This rapidly increasing interest in disability, as a development and human rights issue, means that this emerging field of study will rapidly gain in importance and should become part of any serious higher education programme in social and development studies and in international public health. The course will cover essential knowledge and skills in this subject.

The 4-week course programme will include the following subjects:

- Disability models and stereotypes,
- Frequencies and distribution of disability,

- Experience of having a disability,
- ICF conceptual framework,
- Disability rights, including the UN Convention on the Rights of Persons with Disabilities,
- Culture and disability,
- Determinants of disability, including stigma and discrimination, poverty, gender and HIV/AIDS,
- Measurement of disability,
- Disability-relevant research methods, including survey methods, examples of disability research
- An introduction to community-based rehabilitation.

Onderwijsvorm

Problem-based learning supported by lectures and an article writing assignment

The programme comprises 168 study hours, divided as follows:

- Lectures: 36
- Tutorial groups: 18
- Other events: 12
- Self-study: 102

Toetsvorm

Participation in tutorial groups: 10%

Take-home examination, submitted electronically: 60%

Scientific article: 30%

Literatuur

See e-reader

Vereiste voorkennis

Bachelor-level education; any subject

Doelgroep

The Disability & Development module is an optional course for Master students Management, Policy Analysis and Entrepreneurship in Health and Life Sciences (MPA), International Public Health and Biomedical Sciences; external students from low and middle-income countries are strongly encouraged to apply. We encourage the participation of students with disabilities, especially from low and middle-income countries.

Overige informatie

Jacqueline Kool, MA

Lydia la Rivière-Zijdel, MA

Entrepreneurship in Health and Life Sciences

Vakcode	AM_470575 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. E. Masurel
Docent(en)	prof. dr. E. Masurel
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	500

Doel vak

Students obtain knowledge about and insight in the relevance of entrepreneurship and innovation for their own discipline. Students learn about the processes which are involved in the recognition and exploitation of opportunities, about creating economic and social value and about the nature and role of networks. In addition students gain knowledge of different entrepreneurial processes and the importance of valorisation of (bio)medical findings and business ideas for a knowledge-based economy.

Learning objectives

- Become familiar with an innovation outlook on entrepreneurship.
- Become aware that value-adding opportunities not only contain financial aspects but also social and ecological aspects (sustainable entrepreneurship).
- Gain the ability to write a feasibility plan on how to bring an innovation to the market.
- Obtain knowledge about and insight in the relevance of entrepreneurship and innovation for science disciplines.
- Learn about the processes which are involved in the recognition and exploitation of opportunities, about creating economic and social value and about the nature and role of networks.
- Gain knowledge of different entrepreneurial processes and the importance of valorisation of (bio)medical findings and business ideas for a knowledge-based economy.

Inhoud vak

This course consists of two tracks: a theoretical track and a practical track. These two tracks run simultaneously. In the first track you learn about entrepreneurship. Answers are found on questions such as: What is entrepreneurship? What defines an entrepreneur? What are entrepreneurial opportunities? What is the role of innovation in entrepreneurship? What is corporate social responsibility (CSR)? How can we judge the feasibility of entrepreneurial ambitions? Simultaneously you work on an assignment (second track). In the first week of this course you search for an innovation in your own discipline (product, service, process etc). Your choice must be approved by the lecturers. The first part of the assignment consists of a description of the innovation which you have chosen. Subsequently, you make a SWOT-analysis and a network analysis of the innovation. Also a paragraph on CSR aspect should be added. The final part of the assignment is your own feasibility study: how would you valorize the innovation to the market?

Onderwijsvorm

Lectures, personal meetings. Each week scientific lectures are given (on entrepreneurship, SWOT-analysis, innovation, CSR etc). These lectures are both the basis for the exam and for the assignment. Each week the student has a short meeting with his / her supervisor, in order to discuss the progress of his/her assignment.

Schedule and study time

The total study time is 160 hours.

Tuition methods include lectures, consultancies and self-study.

The different elements have the following study time:

- lectures 18 hours
- consultancies 8 hours
- writing feasibility plan 65 hours

- self study 65 hours
- examination 4 hours

Toetsvorm

You conduct a written exam and an assignment. Both the exam and the assignment determine 50% of the grade. The exam and the assignment must be of sufficient quality.

Literatuur

To be announced on Blackboard

Doelgroep

Optional course for Master students Management, Policy Analysis and Entrepreneurship in Health and Life sciences (MPA), M-differentiation of the Health, Life & Natural Sciences, Biology, Biomedical Sciences.

Overige informatie

Attendance is compulsory. Prior knowledge: Business Management in Health and Life sciences. For information and application:

anna.van.luijn@falw.vu.nl

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
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:

Describe different molecular genetic techniques to study gene expression and genomic variation in response to environmental stimuli.

Explain how to use these techniques in ecological and physiological research.

Analyze experimental data generated by genomics research and knowing the possibilities for follow-up research.

Find and analyze genomic data in databases on internet.

Describe the functional significance of genomic variation for organisms and populations in natural environments.

Explain 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 used to advance our understanding of how organisms make functional responses to changes within their local environment and its consequences for species abundance, community diversity, and the evolution of speciation. In this course we will focus on:

Regulated gene expression. Which genes are turned on in response

to environmental change, 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?

Evolutionary consequences of genomic variation. What are the ecosystem-, community-, and population-level consequences of the molecular transformations performed by these genes?

Reference will be 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.

Onderwijsvorm

Lectures, a seminar discussing recent literature, practical training and self study.

Toetsvorm

Report and oral presentation of a research paper (30% of final grade).

Results of assignments (required online submission). Written exam (70% of final grade).

Literatuur

N. M. van Straalen and D. Roelofs 2006. An Introduction to Ecological Genomics. Oxford University Press.

Vereiste voorkennis

Evolutionary Genetics (AB_470053) or Molecular Developmental Biology (AB_470038)

Overige informatie

This course is not being offered during 2012 - 2013; next occasion will be 2013 - 2014

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
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 owns 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. Attendance is compulsory.

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.

Experimental Design and Analysis

Vakcode	AM_470505 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. ir. P.M. van Bodegom
Docent(en)	dr. ir. P.M. van Bodegom, 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 -ecological- 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 these techniques independently. The application -and not the mathematics- of the techniques 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 PCA, similarity analysis 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 (contact lecturer in the latter case)

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.

Health, Globalisation and Human Rights

Vakcode	AM_470818 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. C.W.M. Dedding

Docent(en)	prof. dr. P. Heutink, dr. M.G.B.C. Bertens
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	500

Doel vak

To acquire knowledge and understanding of the relationship between global public health issues and the global protection of human rights
 To analyse how violations of human rights affect health and well-being
 To learn methods of human rights assessment in relation to innovations in health technology
 To acquire insights into the cultural dimensions of human rights values in relation to public health

Inhoud vak

This course focuses on the human rights issues that are raised around the globe in connection with public health concerns. The course introduces the students to the effects of globalization on health issues, to the relevant UN human rights instruments on health and to the mechanisms to promote and protect these rights. Attention is given to a wide range of human rights topics in which health and well being play a crucial role. Examples are situations of armed conflict, reproductive rights, migration and refugee issues and childrens rights. Within the context of current globalisation processes the importance of local cultural insights into the human rights & public health interaction will be discussed. During the course students will prepare and participate in a simulation on a human rights assessment of innovations in health technology and discuss relevant scientific literature in study groups. In the exam students will show their creative problem-solving skills applying them to human rights dilemmas in public health.

Onderwijsvorm

Contact hours

Lectures: 33 hours

Work groups: 10 hours

Group project, simulation and exam: 8 hours

Self study and preparing: remaining hours

Toetsvorm

Group project (10%), Simulation (20%), exam (70%). All parts need to be passed (6.0)

Literatuur

To be announced at the start of the first work group/lecture

Doelgroep

Optional course for students in all differentiations of the Masters Health Sciences, Biomedical Sciences and Management, Policy Analysis and Entrepreneurship in Health and Life Sciences.

Overige informatie

Guest lectures and guest organisations (under reservation):

Christine Dedding (Children and rights)

Fiona Budge (Culture and Health)

Bert Keizer (Elderly Rights)
Els Mons (Rights and disabled persons)
Women on Waves
Doctors without Borders
And more to be announced.

For more information contact Anna van Luijn: a.van.luijn@vu.nl

History of Life Sciences

Vakcode	AM_471017 ()
Periode	Ac. Jaar (september), Periode 3
Credits	3.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. I.H. Stamhuis
Docent(en)	prof. dr. I.H. Stamhuis, prof. dr. F.H. van Lunteren
Lesmethode(n)	Hoorcollege, Werkgroep, Werkcollege

Doel vak

We will address several of the more conspicuous changes in the life sciences during the last two centuries, such as the emergence of modern genetics, the social basis of Darwin's theory of evolution, the 'molecularization' of the life sciences, and the rise and fall of the eugenic movement. Three additional themes running through the course are the nature of scientific discovery, the disciplinary organization of science and the interaction between science and society.

Inhoud vak

We will address several of the more conspicuous changes in the life sciences during the last two centuries, such as the emergence of modern genetics, the social basis of Darwin's theory of evolution, the 'molecularization' of the life sciences, the rise and fall of the eugenic movement and the complex relationship between ecology and environmentalism. Three additional themes running through the course are the nature of scientific discovery, the disciplinary organization of science and the interaction between science and society.

Onderwijsvorm

Plenary lectures. Group assignments involving presentations. Course information, course lectures and readings, assignments and instructions will be posted on Blackboard.

Toetsvorm

The final grade is the weighted average of the grades of the group presentation (40%) and the individual written exam (60%) with the condition that to pass the exam, the final grade must be at least 6 AND the grades of both parts must be at least 5.

Literatuur

Articles

Overige informatie

N.B. 2012 - 2013 is the last possibility to follow History of Life Sciences.

Internship Brain and Behaviour

Vakcode	AM_471151 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. R.J. van Belle-van den Berg
Niveau	600

Internship Cell Biology

Vakcode	AM_471152 ()
Credits	30.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. R.J. van Belle-van den Berg

Internship Communication Specialisation

Vakcode	AM_471148 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. R.J. van Belle-van den Berg
Niveau	600

Internship Ecology

Vakcode	AM_471150 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. R.J. van Belle-van den Berg
Niveau	600

Doel vak

Both the minor (30 EC) and major (36 EC) research projects serve to get students acquainted and experienced with the practice of ecological research. Both research projects should thus reside in Ecology. At the end of the project a scientific report of the work has to be written as well as an oral presentation given.

Inhoud vak

For research projects in the Ecology department 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), IMARES (fisheries and sea research), 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 drinking-water producing companies. Projects at universities or research institutes outside the Netherlands are also 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 will not be accepted.

Onderwijsvorm

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

- 1) A short description of the research theme and the scientific and societal relevance of your work.
- 2) From this you develop one or more clearly formulated and structured research questions. This is an important point: loosely formulated research questions always produce bad science.
- 3) An explanation of the design of your research. What are you going to do to get an answer to your research question? Here you might also indicate which statistical methods you are going to apply.
- 4) An expectation of how the results would look like under your hypothesis.
- 5) Name(s) of the supervisor(s), and in case you do a project outside our own institute you also give their background and the address/e-mail of their institute.
- 6) A time plan and in case of field work or work abroad a description of the research facilities.
- 7) A safety analysis if you plan to go to a non-western country.

Prior to participating in any thesis or literature survey, both student and faculty staff member and/or external supervisor involved should also fill out a written application and agreement form. This form (for thesis and literature surveys) and the general regulations for internships and literature study can be downloaded from:

www.falw.vu.nl/en/students/regulations/internship-literature-study-regulations. Use the form for the Health and Life Sciences. The form concerns details on supervision, amount of time to be invested, allotted study credits, safety regulations, etc. At the end of the project the student gives a presentation of the work in the Department of Ecology.

Toetsvorm

There is a special assessment form (attached to the application form) that has to be filled out by the first and second lecturer. Projects and literature theses will be assessed according to the following categories:

- A. Practical Execution and Attitude (25%)
- B. Professional Development (10%)

C. Scientific Execution and Content of the Report (50%)

D. Layout and Form of the Report (5%)

E. Oral Presentation (10%) The forms have to be handed to the co-ordinator of the master programme and the student secretary. The master co-ordinator approves or rejects the projects on behalf of the examination board. In order to have the mark registered, the student should hand in an electronic copy of the thesis (via Blackboard), the signed assessment form and an evaluation form at the FALW programme secretariat.

Internship Education Specialisation

Vakcode	AM_471156 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Nederlands
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. R.J. van Belle-van den Berg
Niveau	600

Internship Green Life Sciences

Vakcode	AM_1107 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Niveau	600

Internship Societal Specialisation

Vakcode	AM_471147 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. R.J. van Belle-van den Berg
Niveau	600

Literature Thesis Biology (Research)

Vakcode	AM_471154 ()
Periode	Ac. Jaar (september)
Credits	9.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. R.J. van Belle-van den Berg

Niveau	600
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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
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. This course is also open to PhD students from the SENSE research school.

Overige informatie

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

Methods in Behavioral Neurosciences

Vakcode	AM_470728 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. R.O. Stiedl
Niveau	500

Doel vak

The course will give an overview of methods such as behavior tests and approaches used in a number of different research areas in behavioral neuroscience. It will provide a critical overview on behavioral phenotyping aspects of mice and rats used in biomedical research. Lecturers include Drs. Sabine Spijker, Maarten Loos and Tommy Pattij as experts in their scientific fields.

Inhoud vak

In behavioral neuroscience we study how different brain areas are involved in the control and execution of behavior. Importantly, the methods used have to capture important aspects of the normal behavior of the animal. In order to obtain results that are both reproducible and reliable it is important to that the methods used are standardized and that there is a clear interpretation of what the measures actually mean. Questions that we will address are:

- 1) How can we record animal behavior in a reproducible fashion?
- 2) Which test assays and behavioral parameters are important and which

brain areas are involved?

3) How do we analyze the data that we have obtained?

The following topics will be covered to better understand and judge the behavior test spectrum and its use in behavioral phenotyping:

- Standardization of behavior tests
- Classical and novel tests and measures of anxiety and fear
- Telemetry and optogenetics in behavioral neuroscience
- Experimental approaches to study addictive behavior
- Autonomic functions in behavior as index of emotion
- Studying executive functions in behavior
- Home cage-based phenotyping of mice
- Spatial learning tests in rodents: clues and pitfalls
- Neural aspects of spatial orientation

Onderwijsvorm

Lectures/demonstrations with discussion

Toetsvorm

Student presentation from a spectrum of related topics (15%) and written examination with open-ended questions (85%) determine the final grade.

Literatuur

Primary literature (papers) generally provided through digital blackboard.

Vereiste voorkennis

Basic knowledge of animal behavior.

Microbial Ecology

Vakcode	AM_470511 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. G.A. Kowalchuck
Docent(en)	prof. dr. G.A. Kowalchuck
Lesmethode(n)	Hoorcollege, Computerpracticum, Practicum

Inhoud vak

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

<http://studiegids.uva.nl/web/uva/sgs/en/c/14424.html>

Neurobiology of Animal Behaviour

Vakcode	AM_471018 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen

Coördinator	dr. R.O. Stiedl
Niveau	500

Doel vak

The course will give an overview of research topics of the neural basis of animal behavior from sensory perception to specific behaviors. In this course we will study of a number of model systems from insects to mammals with partly human aspects for psychiatric disorders related to stress. I will do this by critically reviewing both recent literature and a number of classical papers. The course is designed for students who already have a basic knowledge of neurobiology and behavior.

Inhoud vak

When we study the neural basis of behavior we investigate how, in a biological setting, nervous systems generate behavior in specific functional contexts. This is done by combining evolutionary and comparative approaches to the study of nervous system function on a systems level. Questions that we will address are:

- 1) How do neural circuits cause different species-specific behaviors?
- 2) How can we compare the nervous systems of different animals in this respect?
- 3) What exactly are the sensory worlds of the different animals and how do environmental factors contribute to the different behaviors?

The following topics will be studied from neurons via brain areas to behavior:

- Ultimate and proximate questions to study behavior
- Emotional learning and anxiety in rodents
- Echolocation in bats
- Locomotion and pattern generation principles
- Escape behavior in the cockroach and the crayfish
- Auditory communication in insects
- The tactile world of the star-nosed mole and the rat
- Olfactory systems and behavior
- Dominance, hormones and stress

Onderwijsvorm

Lectures with discussion

Toetsvorm

Student presentation from a spectrum of related topics (15%) and written examination with open-ended questions (85%) determine the final grade.

Literatuur

Primary literature (papers) generally provided through digital blackboard.

Vereiste voorkennis

Basic knowledge of animal behavior.

Neuronal Networks in Vivo

Vakcode	AM_1001 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen

Coördinator	dr. C.P.J. de Kock
Docent(en)	dr. C.P.J. de Kock
Lesmethode(n)	Werkgroep
Niveau	600

Doel vak

The aim is to provide insight into the most intricate neuronal network of the brain – the cortical micro-circuit. You will learn the basic floor plan of the cortex and find out the function of different layers and multiple cell types. As the course title suggests, all topics will be addressed from the in vivo perspective which aims to combine cortical function with animal behaviour. You will get hands-on experience in in vivo experiments, data analysis and how to identify different types of cortical neurons.

Inhoud vak

The course starts with plenary lectures on cortical circuitry and on recent advances to study the properties of cortical networks. These advances involve in vivo imaging and electrophysiological techniques that are applied in anaesthetized and awake animals. The lectures will gradually merge into a master class setting where you will work on a mini-thesis. In the mini-thesis you will review two experimental papers (from a pre-selected set) and write a research proposal involving in vivo experiments. In addition, the course will feature demonstrations of in vivo experiments, practical (histological) work and will be concluded with a workshop where you learn how to discriminate and recognize different cortical cell types using real rat brain slices. At the end of the course, you will present your mini-thesis to your peer students.

Onderwijsvorm

Lectures 11 hours 25% 1.5 ECTS
 Demo's in vivo experiments 16 hours 38% 2.3 ECTS
 Histology workshop 8 hours 19% 1.1 ECTS
 Cell identific. workshop 2 hours 5% 0.3 ECTS
 Final presentations 5 hours 12% 0.8 ECTS

Total 42 hours 100% 6.0 ECTS

Toetsvorm

- 1) Written exam
- 2) Presentation on an in vivo methods.
- 3) Written thesis (5 pages) on an in vivo topic, accompanied by a presentation. The topic can fall into three categories: 1) a "hot" current topic in the field. 2) the topic covers a set of papers with conflicting outcomes or 3) the topic covers similar outcomes with different in vivo approaches.

Final grading depends on Exam (25%), Methods presentation (25%), Written topic thesis (25%), and Topic presentation (25%).

Literatuur

Oberlaender et al, Cereb Ctx 2012
 Egger et al, PLoS Comp Biol 2012
 Markram et al, Nat.Neurosci 2006
 Hill et al, PNAS 2012

Vereiste voorkennis

To be announced

Doelgroep

Master of Neuroscience students of VU University Amsterdam or other universities. The course is optional for all Master of Neuroscience tracks.

Overige informatie

Guest Lecturers:

Hemanth Mohan, MSc, FALW

Roel de Haan, MSc, FALW

Anton Pieneman, FALW

Plant Breeding and Biotechnology

Vakcode	AM_470626 ()
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Niveau	500

Doel vak

This course provides knowledge on recent developments in plant breeding and future prospects in plant biotechnology. A thorough understanding of plant breeding and genetic modification is linked to applications in various fields (crop improvement, functional food, medicines, soil remediation and biofuel production). After a general introduction into a field, recent papers covering new developments in biotechnology will be discussed by/with the participants. Students should get acquainted with technological challenges and possibilities of Plant Biotechnology. Through case studies, societal aspects of the application of current GM- crops will be discussed.

Inhoud vak

The following subjects will be dealt with:

- Modern plant breeding (DNA markers)
- Plant transformation, T- DNA integration and expression
- RNAi methodology and application
- GM- Crops worldwide (including societal aspects)
- Plants as sources for food supplements and nutrients
- Production of pharmaceutical proteins and chemicals
- Biofuel production
- Phytoremediation

Onderwijsvorm

Lectures, paper discussion, practical/demonstration of technologies.

Toetsvorm

Written exam (70%), oral presentations (30%)

Literatuur

Selected book chapters, recent articles and reviews

Vereiste voorkennis

Bachelor Biology, Medical Biology, Biochemistry or equivalent

Overige informatie

Coordinator: prof. dr. M.A. Haring (UvA)

Policy, Politics and Participation

Vakcode	AM_470589 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. J.T. de Cock Buning
Docent(en)	dr. B.J. Regeer, dr. J.F.H. Kupper, prof. dr. J.E.W. Broerse
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	500

Doel vak

To further deepen your analytic skills with respect to the assessment of a specific societal problem;

To acquire further insight into the practice of interactive research;

To acquire further insights into specific methods and techniques of interactive research;

To strengthen the skills to design an interactive research project

To practice skills in data collection and analysis;

To learn to set up valid lines of argumentation;

To improve your communication skills;

To improve your skills in working effectively in a project team, through team building, team analysis and feedback.

Inhoud vak

In this course you get the chance to gain experience in the practical implementation of methodologies for interactive research. In a four week policy project you will both improve your focus group research skills and deepen your understanding of the relevant theoretical concepts in the areas of policy studies, science and technology studies and democracy theory. In a group of about ten students you will participate in a real interactive research project which is executed at the Athena institute. In this project you will be trained in and practice various skills for data collection (such as focus group design and facilitation) and data analysis (such as qualitative content analysis).

Specific attention is paid to your personal interactive research skills.

At the end of the course, you

prepare a policy report to present your findings. In an oral presentation your team will highlight the main results of your analysis and defend the recommendations you propose.

Onderwijsvorm

Lectures, training workshops, project assignment

Toetsvorm

Individual evaluation based on personal performance in the project group and assessment of various group products (report and presentation). All parts need to be passed.

Literatuur

To be announced on Blackboard

Doelgroep

Optional course for Master students Management, Policy Analysis and Entrepreneurship in Health and Life sciences (MPA), Societal differentiation of the Health, Life & Natural Sciences.

Overige informatie

Basic knowledge of (interactive) policy processes, policy analysis and relevant research skills are required.

Attendance is compulsory.

Qualitative and Quantitative Research Methods

Vakcode	AM_470582 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. J.F.H. Kupper
Docent(en)	dr. H. Wels, dr. B.J. Regeer, dr. J.F.H. Kupper, dr. ir. R. Hoopman
Lesmethode(n)	Hoorcollege, Werkgroep, Computerpracticum
Niveau	400

Doel vak

Understanding the differences between beta- and gamma research
To acquire insight and understanding of a transdisciplinary research process. This includes knowledge of the character of and need for transdisciplinary approaches, and their advantages and disadvantages
To acquire insight into various quantitative and qualitative research methods and their underlying theoretical concepts
To understand the relative strengths and weaknesses of the various research methods
To know how to interpret quantitative and qualitative findings
To acquire insight and understanding of the possibilities to integrate quantitative and qualitative research information
To be able to make an adequate transdisciplinary research design for the investigation of a specific problem.

Inhoud vak

Contemporary societies increasingly face complex social problems, like climate change, HIV/ AIDS or ethnic and religious diversity . These complex problems involve a variety of social actors: policy-makers, professionals, NGOs, industry, science and of course the public at large. Addressing such complex issues demands a transdisciplinary approach that investigates, analyzes and integrates the positions and knowledge of different actors. This course offers an (advanced) introduction to various research methods used in transdisciplinary research: questionnaires, systematic observations using all the senses,

surveys and statistics, semi-structured in-depth interviews, as well as several interactive and participatory methods. These methods are commonly used in transdisciplinary research into complex problem contexts, communication, and opportunities for intervention. Strengths and weaknesses of each research method and technique will be discussed, as well as its possibility to be applied in different societal contexts. Throughout the course, you will apply theoretical knowledge about the various research methodologies in the training of different qualitative and quantitative methods, and in making a research design. In small groups, students are trained in: (1) qualitative research methods such as semi structured interviews and observation techniques, (2) quantitative research methods such as questionnaires, 3) analysis of the data, and (4) writing a transdisciplinary research design.

Onderwijsvorm

Lecture (20h), Training workshops (30h), Self-study (107h), Examination (3h).

Toetsvorm

Group assignment (50%) and exam (50%). Both parts need to be passed (6).

Literatuur

Announced on blackboard one month before course starts

Doelgroep

Compulsory course in the Master programme Management, Policy Analysis and Entrepreneurship for the Health and Life Sciences (MPA) and compulsory course within the Science communication- and Societal differentiations of Health, Life and Natural Sciences Masters programmes.

Overige informatie

Attendance of training workshops is compulsory. For further information please contact harry.wels@falw.vu.nl.

Science and Communication

Vakcode	AM_470587 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. B.J. Regeer
Docent(en)	dr. B.J. Regeer, dr. J.F.H. Kupper, T. de Lange MSc, B.M. Tielemans
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	500

Doel vak

- Gain theoretical insight in the relationship between science and society,
- Gain insight in the role of science communication in this relationship,
- Acquire knowledge of different theories and models of science communication,

- Acquire knowledge of different strategies, media and activities for science communication,
- Learn how to apply theoretical concepts to real-life examples,
- Development of practical skills for science communication (e.g. writing, discussing).

Inhoud vak

Science is all around us and shapes our lives in many different ways. From the vaccines you need for travelling abroad, to the technological devices you use on a daily basis. At the same time, society shapes the development of science and technology. Science and society influence each other continuously; they communicate. Students of Science Communication are expected to become experts in understanding and designing interaction between science and society. In order for this interaction to be fruitful and valuable for both science and society, it is important to gain in-depth knowledge about the theoretical basis of the field of science communication and understand communication processes at the core of several interfaces; e.g. the communication between scientists from different disciplines, between different sciences and their stakeholders, and between science and the public. This course provides a broad basis in the field of science communication by addressing the main areas of science communication and by discussing and challenging several core concepts within this field. Students are invited to explore some issues in greater depth and active participation in lectures and workgroups is required.

Onderwijsvorm

Lectures (22 h)
 Workgroups (18 h)
 Home-study for group assignments (8 h)
 Home-study for individual assignments/exam (90h)

Toetsvorm

Individual assignments (30%), group assignment (10%), examination (60%).
 For all parts a pass grade needs to be obtained.

Literatuur

Academic articles. Direct links to articles will be provided on BlackBoard one month before the beginning of the course.

Doelgroep

The course Science and Communication is a compulsory course for students of the Master specialisation Science Communication (Wetenschapscommunicatie) and is a prerequisite for the internship. Science and Communication is an optional course for students from other master programs in the health and life sciences.

Overige informatie

Guest lecturers amongst others:
 A. van der Plas (TNO)
 F. van Dam (CSG, Centre for Society and the Life Sciences)

Science in Dialogue

Vakcode	AM_1002 ()
Periode	Periode 2
Credits	6.0

Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. J.F.H. Kupper
Docent(en)	dr. J.F.H. Kupper
Lesmethode(n)	Werkgroep, Hoorcollege
Niveau	500

Doel vak

To gain knowledge and insight into:

- the basic concepts and issues in the understanding of science-society interactions, both from a philosophical and communication science perspective
- the nature and course of interpersonal and group communication processes relevant to the formal and informal dialogue between science and society
- the nature and form of dialogical science communication, aimed at mutual understanding and learning

To acquire or improve:

- the individual student's skills for effective interpersonal communication
- the individual student's skills for the design and facilitation of the science-society dialogue

Inhoud vak

This course examines the public character of scientific controversy and focuses on the communicative aspects of a fruitful science-society dialogue. At the dawn of the 21st century, science, and particularly fields that combine science and engineering such as nanotechnology and synthetic biology, holds a great promise for the progress of our societies. At the same time, these developments are controversial. They lead to a variety of concerns related to risks, benefits and wider moral issues. Nanotechnology creates materials with novel characteristics that help us, but may also contain risks for health and environment. Synthetic biology develops new biological systems that may be very useful, but radically change the nature and meaning of life. Clearly, advances in science do not always match the needs, desires and expectations of society. On the other hand, parts of society might not always appreciate the nature and scope of scientific findings. For a fruitful relationship between science and society, a constructive science-society dialogue is necessary.

This course offers advanced lectures on the basic concepts and issues of dialogical science communication: communication, learning, dialogue, understanding, controversy, democracy. A series of workshops and small group assignments presents communicative tools and spaces such as discussion games, science theatre and multimedia platforms that can be used to design and facilitate science-society interactions. Training workshops will focus on improving the students' individual communication and facilitation skills. The students' individual learning curve as a science communicator and facilitator is monitored by means of a personal development plan. The course is completed with an individual essay assignment about the sense and nonsense of the science-society dialogue.

Onderwijsvorm

Lectures (14h), Workgroups (28h), Training workshops (24h), Selfstudy, (82h), Dialogue presentations (12h)

Toetsvorm

Group assignment (50%), Take home exam (30%), Mini portfolio (20%)

Literatuur

Is announced on blackboard one month before start of the course

Doelgroep

Optional course in the MSc specialization Science Communication

Overige informatie

Independence and a cooperative attitude is expected. Attendance to training workshops is indispensable.

Science Journalism

Vakcode	AM_471014 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. J.F.H. Kupper
Docent(en)	dr. J.F.H. Kupper, W.J. Breukers MSc, dr. M.J.W. Bos
Lesmethode(n)	Hoorcollege, Werkgroep, Computerpracticum
Niveau	500

Doel vak

To acquire knowledge and insight into:

- the popularization of natural scientific knowledge and the use of different media
- the criteria for effective science journalism with respect to diverse media
- the role of science journalists in the debate about knowledge in society

To acquire skills in:

- writing popular scientific texts for different genres such as news, background and interview
- designing science communication for different media such as newspaper, radio and internet

Orientation to the professional practice of science journalism

Inhoud vak

This course teaches the basic principles of science journalism. A series of interactive lectures reviews both the practical as well as the theoretical aspects of science journalism. Topics that are discussed are the translation of science to a language that is both compelling and understandable, the role of journalism in the interaction between science and society, images of science in the media and the ethics of science journalism. The interactive lectures invite you to take your own defensible position with regard to these issues.

Guest lectures provide insight into the professional practice of science journalists. The guest speakers work as freelancer, editor or producer at diverse science media, such as newspapers (NRC, Volkskrant), magazines (NWT), internet (Noorderlicht) and radio (Labyrint).

Finally, the course trains specific skills that you need as a science

journalist, such as popular writing, interviewing, conceptual analysis and program design.

Onderwijsvorm

Lectures and seminars on theory and practice of science journalism and writing skill training (36h). Considerable time is set aside for performing science journalism in assignments (108h). The assignments are assessed by lecturers and fellow students (peer-review process). Self study (16h).

Toetsvorm

Individual exam (20%), Individual Assignments (50%, Small Group Assignments (30%)

Literatuur

Announced on Blackboard one month before start of the course

Doelgroep

All Master students with a Beta-Bachelor degree. Students taking this course as part of their C-differentiation within FALW or FEW will have precedence over other students. Students from other faculties and or universities need to get formal consent from the course co-ordinator (Frank Kupper) before enrolment.

Overige informatie

Course is taught in Dutch. More information: f.kupper@vu.nl.

Science Museology

Vakcode	AM_470590 ()
Periode	Periode 3
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. B.J. Regeer
Docent(en)	dr. B.J. Regeer, drs. ir. M.G. van der Meij, T. de Lange MSc
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	500

Doel vak

- Gain insight in the role of museum exhibits in the field of science communication.
- Apply theoretical notions of science communication and science education, to conduct science communication research in museum settings.
- Apply qualitative and quantitative research methods to design, conduct, and report on a research project in museum settings.
- Apply theoretical notions of science communication, science education and exhibit design to advise on adjustments and/or development of exhibitions.

Inhoud vak

This course is about the role of science museums/centers, zoos and natural history museums in science communication. You will get familiar with theories of science communication and informal science education in

museum setting, and will be introduced to different educational methods as well as styles of communication, different approaches to exhibit design & development, and different methods of research and evaluation of exhibitions.

Guest speakers give insight into their profession (1) as science communicators in museums and science centers, (2) as researchers in the field of museology, and/or (3) as professionals in developing informal science & technology learning programs.

Through several assignments you are encouraged to combine theory and practice, working step-by-step towards (part of) an exhibition (re-) design. The assignments come from museums and science centers, such as NEMO, Museon, Naturalis, Delft Science Centre, and Artis.

Onderwijsvorm

Lectures (14 h)

Workgroups (40 h)

Home-study for group assignments (64 h)

Home-study for individual assignments (32 h)

Toetsvorm

Group assignment (40%), presentations (poster and oral) (10%), and exams (take-home and written) (50%). For all the assignment, presentations and all exams a pass-grade must be obtained.

Literatuur

Academic articles. Direct links to articles will be provided on Blackboard one month before the beginning of the course.

Vereiste voorkennis

Bachelor in any of the Beta Sciences

Doelgroep

Optional course in the C-differentiations (Science Communication) of most of the two-year master programs of the FALW and FEW faculties.

Master students from other universities in any scientific field are welcome as well.

Overige informatie

Guest lecturers:

E. Hamstra (Northernlight)

C. Vermeulen (Artis)

M. van der Meer (Delft Science Centre)

I. van Zeeland (Naturalis)

And possibly additional guest lecturers from NEMO, Boijmans van Beuningen, Museon, Van Gogh Museum, etc.

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.

Doelgroep

This course is only open to students of the Master's programmes of the Faculty of Earth and Life Sciences mentioned below. These students are only eligible to the course if they have already conducted scientific research (e.g. for their Bachelor's thesis) or if they will be working on a research project when taking Scientific Writing in English.

Faculty of Earth and Life Sciences - Master's programmes:

- Biology;
- Health Sciences;
- Ecology;
- Biomolecular Sciences;
- Biomedical Sciences;
- Neurosciences;
- Global Health;
- Management, Policy Analysis and Entrepreneurship in Health and Life Sciences.

Overige informatie

- To do well, students are expected to attend all lessons. Group schedules are to be found at rooster.vu.nl and on Blackboard.
- A VUnet registration for this course is necessary in order to enroll or be enrolled in a Blackboard group. The VUnet registration automatically gives access to the corresponding Blackboard site.
- Group enrollment only takes place via Blackboard. For open/general groups: students have to enroll themselves following FALW programmes containing this course. For group assigned to specific studies, students are enrolled by the course coordinator).
- Make sure Scientific Writing in English does not overlap with another course.
- If you have registered for a group in Blackboard, you are expected to attend all sessions (eight). If you decide to withdraw from

the course, do so in time, both on Blackboard and in VUnet. This all will avoid a 'fail' on your grade list for not taking part in this course and allows other students to fill in a possible very wanted group spot.

- If you (expect to) miss a session, please inform the group trainer as soon as possible. If you miss a session without notification, you may not be able to finish the course.

- For any questions concerning this course, please contact the course coordinator Marieke Zantkuijl: m.c.l.zantkuijl@vu.nl

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
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
Niveau	500

Doel vak

Students will be able to:

Underpin the importance of ecological interactions between the soil-subsystem and the plant-subsystem

Critically evaluate and investigate the relevant interactions between soil-soil organisms, soil-vegetation, and soil organisms-vegetation

Critically evaluate and investigate the relevant functional traits that underlie ecological interactions between the soil-subsystem and plant-subsystem

In the field: apply different techniques to survey the soil-subsystem and plant-subsystem, and to sample soil and soil organisms in the field

In the laboratory: investigate soil organisms and carry out ecological and biochemical analyses relevant to plant-soil interactions.

Inhoud vak

A hot theoretical topic in Ecology concerns the interdependency of belowground (green web) and aboveground compartments (brown web). This comprises key conceptual issues relating to interactions between above- and belowground communities, the importance of functional traits to understand these interactions in the community, 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.

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

The brown food web: biotic interactions and regulators

Plant species and plant trait control of soil biota and processes

Belowground consequences of green food web interactions
Completing the circle: how soil food 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 Abisko, N-Sweden) where soil-plant interactions in subarctic ecosystems are currently being studied, with emphasis on (a) design and statistical treatment of soil-plant experiments, (b) techniques to identify soil organisms and analyses soil processes, biochemistry and vegetation development.

Toetsvorm

A seminar about one of the papers/chapters in the reader (25%), individual performance in critical group discussions about important theory based on these papers/chapters (25%), a final presentation (50%) about background, design and results of own research project.

Literatuur

Reader with selected literature, which includes recent key papers in international journals and extracts from David A. Wardle (2002): "Communities and Ecosystems": linking the aboveground and belowground component (Monographs in Population Biology nr 34). Princeton University Press.

Vereiste voorkennis

Community Ecology, Systems Ecology.

To attend this course there will be costs involved. To cover the expenses for the reader, travel to Swedish Lapland and accommodation a substantial fee is asked from MSc students.

Doelgroep

MSc students with focus on ecology.

Spatial Ecology and Global Change

Vakcode	AM_470502 ()
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. J. Rozema
Lesmethode(n)	Hoorcollege, Excursie

Doel vak

The main aim of the course is the analysis of spatial and temporal distribution of organisms in the context of global climate change. In fact this refers to the field of biogeography.

In this course, MSc students will learn about the different vegetation zones of the earth, climate zones and climate change, biodiversity, disturbance history, ecosystem dynamics, patterns of distribution, and patterns of fauna and flora in the past and future. Special attention will be given to the range dynamics of species, that is, analysis of

the factors that cause the range of a species to expand or diminish, depending on locally varying environmental factors. This course will emphasize an evolutionary and ecological approach, providing a causal explanation of the (changes) in the distribution of organisms. At the end of this course, students will have a deeper understanding of the patterns of distribution of living organisms across the earth's surface, and the underlying mechanisms.

Inhoud vak

Analysis and explanation of spatial and temporal distribution patterns comes from various scientific fields: ecology, evolution biology, phylogeny, paleontology, geology, geography, and climatology. Questions will be addressed such as why and how plant and animal species have become extinct, discussing natural and man-made causes. This is essential to understand past and present biodiversity on earth and how to preserve biodiversity. Various examples of how distributional changes relate to past and recent factors and processes will be treated. Glaciations and de-glaciations and the positioning of mountain ranges have differentially affected biodiversity of the North American and Eurasian Continent. Current global change, such as global warming and sea level rise leads to similar changes in distribution patterns of plants and animals and further insight and evidence for this comes from past climate change. This course on spatial ecology and global change ecology will cover the following topics:

- Introduction to biogeography
- A history of biogeography
- Patterns of Distribution
- Patterns of Climate
- Living in the past
- Early life and moving continents
- Rise of the flowering plants
- Cretaceous and Cenozoic climate, geographic animal and floral changes
- Geography of life today
- Ice and Change
- Molecular and isotopic biogeography
- Methods of biogeographical analysis
- Paleogeography

The course will be given during 4 weeks, covering the afternoon of the first three weeks.

A first series of sessions will deal with dynamics of distribution areas and modeling; a second part consists of treatment of cases of spatial ecology of insects and invertebrate animals and the third part deals with case studies on plants and current and historic plant distributions.

Onderwijsvorm

The textbook mentioned will be used and the teachers of this course will treat parts of this textbook. General and modeling aspects of spatial and temporal distributions of organisms will be discussed, N. M van Straalen will address patterns of distribution of animals in an evolutionary context. J. Rozema will treat the distribution of plants with particular reference to the impact of global change. Evidence of how climate change has affected plant distribution on earth will be derived from the fossil pollen record. An excursion will be made to the Naturalis Museum, Leiden, to view and study various plant and animal groups representing relevant evolutionary and present-day developments.

Relevant recent literature on this aspect will be studied and discussed. Discussion sessions will be held on each aspect. Students

are asked to write an essay on one of the aspects, to prepare an oral presentation and a written examination will complete the course.

The lecturers will introduce the basic ideas and subject matter of tuition and highlight some features of the aspect to be dealt with. The students are expected to write an essay based on topics explored by self study (a. o. search for literature) and prepare an oral presentation of the content of a journal paper or book chapter, which will be discussed.

Toetsvorm

Judgement and examination will be based on the essay completed, and the oral presentation (33. 3%) of the content of a journal paper or book chapter, a practical assignment (16. 7%) and a written examination (50%) on the subject matter of tuition.

Literatuur

The textbook "Biogeography, An Ecological and Evolutionary approach" by C.B. Cox, P.D. Moore. 2005. Blackwell Publishing. 7th edition. pp. 428 (Euro 32. 95) and additional selected articles (distributed beforehand).

Doelgroep

This course is obligatory for all students following the program of MSc Ecology. It will provide a basic training for various follow-up courses of choice.

Overige informatie

Please note: will not be offered in 2012 – 2013; possibly replaced per 2013 – 2014.

Spatial Processes in Ecology and Evolution

Vakcode	AM_1039-UvA ()
Periode	Periode 1
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/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.

System Neurosciences

Vakcode	AM_470712 ()
Periode	Periode 2
Credits	6.0

Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. T.J. de Vries
Niveau	500

Doel vak

- Understanding of approaches to study the central nervous system in an integrated and multidisciplinary way with a strong focus on how the complexity of the brain is required for complex behaviour.
- The ability to write a research proposal from a system neuroscience perspective

Inhoud vak

Systems Neurosciences is a "way of life": approaching the study of the central nervous system in an integrated and multidisciplinary way. Once learned in an exemplar system, the systems approach can be applied to essentially any functional system in the CNS. In this course we will restudy the organization of essential systems, such as the sensory and motor systems, associational systems, autonomic nervous system and hypothalamus, etc. This will to a large extent consist of textbook-based homework assignments with short presentations and discussion. The core of the course will take examples of systems involved in learning and memory, in particular those involved in declarative learning and memory. Based on selected review- type papers/chapters we will a) follow the development of concepts over time; b) discuss the relationship between technology-development and experimental approaches c) study and discuss different approaches and d) integrate those into a concept of systems neurosciences.

Onderwijsvorm

Lectures, homework assignments, presentations, and tutored discussions.
Contact hours: 24
Selfstudy 48

Toetsvorm

Self-study with evaluations by way of presentations and discussions;
final thesis on a self-selected topic.

Literatuur

Kandel ER, Schwartz JH, Jessell TM Principles of Neural Science, 2000, 4th edition, McGraw Hill, ISBN 0-07-112000-9. All chapters
This book will be used in the course as background literature and for a large part of self study assignments. Other literature will be provided during the course or will be self-selected.

Vereiste voorkennis

Principles of Neuroscience or similar advanced neuroscience course

Aanbevolen voorkennis

Basic neuroscience

Overige informatie

Guest lecturers: Prof dr Kees Stam, Prof dr Cyriel Pennartz, Prof dr Jeroen Geurts, dr Ysbrand van der Werf, dr Jamie Peters, dr Matthew Self