



Biomedical Sciences MSc

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

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 biomedical research.

The Master's programme in Biomedical Sciences 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:

- Cardiovascular diseases
- Immunology
- Infectious diseases
- International public health
- Psychophysiology
- Medical and behavioral genomics

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 2014 - 2015 can be found at the [FALW-website](#) .

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

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

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Expired programme components Biomedical

Courses:

Name	Period	Credits	Code
History of Life Sciences	Period 3	3.0	AM_471017
Internship Societal Specialisation	Ac. Year (September)	30.0	AM_471144
Statistical Genetics for Gene Finding		5.0	AM_470734

MSc Biomedical Sciences, Non-Research Specialisation Programmes

Based on the assumption that Master's students following the Communication, Education and Science in Society specializations should also have research experience, the research specialization consists of 57 EC and should include a biomedical research internship.

Opleidingsdelen:

- [MSc Biomedical Sciences, Communication Specialisation](#)
- [Biology](#)
- [MSc Biomedical Sciences, Specialisation Science in Society](#)

MSc Biomedical Sciences, Communication Specialisation

Courses:

Name	Period	Credits	Code
Communication, Organization and Management	Period 2	6.0	AM_470572
Internship Communication Specialisation	Ac. Year (September)	30.0	AM_471145
Qualitative and Quantitative Research Methods	Period 1	6.0	AM_470582
Science and Communication	Period 1	6.0	AM_470587
Science in Dialogue	Period 2	6.0	AM_1002
Science Journalism	Period 2	6.0	AM_471014
Science Museology	Period 3	6.0	AM_470590

Biology

Courses:

Name	Period	Credits	Code
Internship Educational Specialisation	Ac. Year (September)	30.0	AM_471143

MSc Biomedical Sciences, Specialisation Science in Society

The Master's graduate with a science in society specialization combines an academic approach with the skills and competences that will allow him or her to perform scientific research at the interface of the biomedical sciences and society. The specialization aims to develop strategies that contribute to an understanding of complex societal problems and strategies to solve complex societal problems through interdisciplinary research. In addition, the programme analyses the social, economic and ethical aspects of new developments in the biomedical sciences, so as to assess their implications for society. Master's graduates have the necessary skills to collaborate and communicate with researchers from various scientific disciplines (including but not limited to those in the life sciences) and societal actors, and the ability to use these academic insights.

The Science in Society specialization has a study load of 54 EC and is taught in English.

Vakken:

Naam	Periode	Credits	Code
Analysis of Governmental Policy	Periode 1	6.0	AM_470571
Business Management in Health and Life Sciences	Periode 2	6.0	AM_470584
Clinical development and clinical trials	Periode 3	6.0	AM_470585
Communication, Organization and Management	Periode 2	6.0	AM_470572
Disability and Development	Periode 2	6.0	AM_470588
Entrepreneurship in Health and Life Sciences	Periode 2	6.0	AM_470575
Health, Globalisation and Human Rights	Periode 2	6.0	AM_470818
Internship Science in Society (BMED)	Ac. Jaar (september)	30.0	AM_1133
Policy, Politics and Participation	Periode 2	6.0	AM_470589
Qualitative and Quantitative Research Methods	Periode 1	6.0	AM_470582
Science in Dialogue	Periode 2	6.0	AM_1002

MSc Biomedical Sciences, Research Specialisation Programmes

The prescribed scope of a research specialization is a minimum of 54 EC and includes a research internship (30 EC) and at least three course-based elements from the specialist area (18 EC) and: an extra optional

course (6 EC) or an extension of the internship (6 EC) or the literature study in the field of specialization (9 EC).

When the student chooses one research specialization, the subject of the literature thesis has to lie within the field of specialization (9 EC).

The programme is completed with the compulsory general courses (6 EC), other specialization courses (24 EC) and a second research internship (30 EC).

Opleidingsdelen:

- [MSc Biomedical Sciences, spec. Cardiovascular Diseases](#)
- [MSc Biomedical Sciences, spec. Immunology](#)
- [MSc Biomedical Sciences, spec. Infectious Diseases](#)
- [MSc Biomedical Sciences, spec. International Public Health](#)
- [MSc Biomedical Sciences, spec. Medical and Behavioural Genomics](#)
- [MSc Biomedical Sciences, spec. Psychophysiology](#)

MSc Biomedical Sciences, spec. Cardiovascular Diseases

The Master's graduate with a specialization in Cardiovascular diseases has a broad understanding of the cardiovascular system. The topics that are addressed range from atherosclerosis to ventricular dysfunction, giving the student a thorough overview of this particular field of research. The Master's graduate has the ability to conduct scientific research in the field of cardiovascular disease and to critically assess the results of cardiovascular research. The Master's graduate has specialized in one of the subjects within the field of cardiovascular disease. He/she possesses knowledge of current theory and the key research questions in this field and has an understanding of the scientific and social relevance of this subject area.

Three specialised courses (18 EC) and a research placement (30 EC) are compulsory, and: an extra optional course (6 EC) or an extension of the internship (6 EC) or the literature study in the field of specialization (9 EC). The course programme consists of the following components, with the study load for each component given in EC.

Opleidingsdelen:

- [spec. Cardiovascular Dis. - choose 18 EC](#)

Vakken:

Naam	Periode	Credits	Code
Internship Cardiovascular Diseases	Ac. Jaar (september)	30.0	AM_471136

spec. Cardiovascular Dis. - choose 18 EC

Vakken:

Naam	Periode	Credits	Code
Clinical Aspects of Heart and Circulation	Periode 1	6.0	M_CCLINBIO09

Pathophysiology of Heart and Circulation	Periode 1	6.0	M_CPATHO09
Remodelling of the Circulatory System	Periode 2	6.0	M_CREMODE09
Vascular Function and Metabolic Diseases	Periode 2	6.0	M_CVASCFU09

MSc Biomedical Sciences, spec. Immunology

The Master's graduate with a specialization in Immunology has a broad understanding of immunological processes, ranging from the molecular and cellular interactions between host and pathogen to an integrative knowledge of the role of the immune system in various pathologies, such as cancer, infectious diseases and autoimmunity. The Master's graduate has specialized in one of the subjects within the field of immunology. He/she possesses knowledge of current theory and the key research questions in the field of immunology and has an understanding of the scientific and social relevance of this subject area.

Three specialised courses (18 EC) and a research placement (30 EC) are compulsory, and: an extra optional course (6 EC) or an extension of the internship (6 EC) or the literature study in the field of specialization (9 EC). The course programme consists of the following components, with the study load for each component given in EC.

Opleidingsdelen:

- [verplichte vakken](#)
- [kies tenminste 2 van deze cursussen](#)

verplichte vakken

Vakken:

Naam	Periode	Credits	Code
Advanced Molecular Immunology and Cell Biology	Periode 1	6.0	AM_470656
Internship Immunology	Ac. Jaar (september)	30.0	AM_471137

kies tenminste 2 van deze cursussen

Vakken:

Naam	Periode	Credits	Code
Clinical Immunology	Periode 2	6.0	AM_470655
Immunity and Disease	Periode 1	6.0	AM_1031
Molecular Infection Biology	Periode 2	6.0	AM_470657

MSc Biomedical Sciences, spec. Infectious Diseases

The Master's graduate with a specialization in Infectious diseases has a broad understanding of the biology of pathogenic organisms and the interaction between pathogens and their hosts. The Master's graduate has the ability to conduct scientific research in the field of medical microbiology and to critically assess the results of microbial research. The Master's graduate has specialized in one of the subjects within the field of medical microbiology. He/she possesses knowledge of current theory and the key research questions in this field and has an understanding of the scientific and social relevance of this subject area.

Three specialised courses (18 EC) and a research placement (30 EC) are compulsory, and: an extra optional course (6 EC) or an extension of the internship (6 EC) or the literature study in the field of specialization (9 EC). The course programme consists of the following components, with the study load for each component given in EC.

Opleidingsdelen:

- [verplichte vakken](#)
- [minimaal 6 EC te behalen](#)

verplichte vakken

Vakken:

Naam	Periode	Credits	Code
Advanced Molecular Immunology and Cell Biology	Periode 1	6.0	AM_470656
Internship Infectious Diseases	Ac. Jaar (september)	30.0	AM_471138
Molecular Infection Biology	Periode 2	6.0	AM_470657

minimaal 6 EC te behalen

Vakken:

Naam	Periode	Credits	Code
Containment Strategies of Infectious Diseases in Global Context	Periode 1	6.0	AM_470127
Health Geography	Periode 2	6.0	AM_470094
Parasitology	Periode 2	6.0	AM_470052
Parasitology	Periode 2	6.0	AM_1055
Viral Oncogenesis	Periode 4	3.0	M_OVIRONC03

MSc Biomedical Sciences, spec. International Public Health

The Master's graduate with a specialization in International public health has a broad understanding of current and future challenges in international public health, their main causes, and applied and potential interventions. The Master's graduate has specialized knowledge of relevant concepts from various disciplines, including epidemiology, policy science, anthropology, management studies, biomedical sciences and health sciences. The Master's graduate has the ability to conduct scientific research in the field of international public health and to critically assess the results of international public health research.

The Master's graduate has specialized in one of the subjects within the field of international public health. He/she possesses knowledge of current theory and the key research questions in this field and has an understanding of the scientific and social relevance of this subject area.

Three specialised courses (18 EC) and a research placement (30 EC) are compulsory, and: an extra optional course (6 EC) or an extension of the internship (6 EC) or the literature study in the field of specialization (9 EC). The course programme consists of the following components, with the study load for each component given in EC.

A course in epidemiology (6 EC) is compulsory to be admissible to this specific specialization. VU-students with a deficiency in epidemiology can obtain the relevant knowledge through the bachelor's course 'Epidemiology', external students can include the former course in their bachelor's programme or do a (paid) summer course prior to the start of the academic year.

Vakken:

Naam	Periode	Credits	Code
Containment Strategies of Infectious Diseases in Global Context	Periode 1	6.0	AM_470127
Disability and Development	Periode 2	6.0	AM_470588
Health, Globalisation and Human Rights	Periode 2	6.0	AM_470818
International Comparative Analyses of Health Care Systems	Periode 3	6.0	AM_470820
Internship International Public Health	Ac. Jaar (september)	30.0	AM_471139
Policy, Management and Organisation in International Public Health	Periode 2	6.0	AM_470819
Research Methods for Need Assessments	Periode 1	6.0	AM_470817

MSc Biomedical Sciences, spec. Medical and Behavioural Genomics

The Master's graduate with a specialization in Medical and Behavioral Genomics has an understanding and knowledge of the application of genomics in studying complex disorders and traits, including mental

health and neurodevelopmental disorders. In this rapidly developing field, the student's knowledge covers basic classical genetics and biometrical approaches, genetic epidemiology and genetic association and linkage methods. Skills include application of these methods not only to data from genetics and genomics platforms, but also from gene expression (transcriptomics) and endophenotypes.

Three specialised courses (18 EC) and a research placement (30 EC) are compulsory, and: an extra optional course (6 EC) or an extension of the internship (6 EC) or the literature study in the field of specialization (9 EC). The course programme consists of the following components, with the study load for each component given in EC.

Opleidingsdelen:

- [verplicht vak](#)
- [minimaal 17 EC te behalen](#)

verplicht vak

Vakken:

Naam	Periode	Credits	Code
Internship Med. and Behavioural Genomics	Ac. Jaar (september)	30.0	AM_471142

minimaal 17 EC te behalen

Vakken:

Naam	Periode	Credits	Code
Complex Trait Genetics	Periode 2	6.0	AM_470733
Genomic Data Analysis	Periode 2	6.0	AM_1008
Statistical Genetics for Gene Finding	Periode 1	6.0	AM_1040

MSc Biomedical Sciences, spec. Psychophysiology

The Master's graduate with a specialization in Psychophysiology has a broad understanding of the functions of the central and peripheral nervous system and a special knowledge of the measurement of these functions through physiological recording techniques (cardiovascular, EEG, MRI, hormones). The Master's graduate has the ability to conduct scientific research in the field of psychophysiology and to critically assess the results of psychophysiological research. The Master's graduate has specialized in one of the subjects within the field of psychophysiology. He/she possesses practical skills in psychophysiological measurement and has knowledge of current theory and the key research questions in this field. She/he has an understanding of the scientific and social relevance of this subject area.

Three specialised courses (18 EC) and a research placement (30 EC) are

compulsory, and: an extra optional course (6 EC) or an extension of the internship (6 EC) or the literature study in the field of specialization (9 EC). The course programme consists of the following components, with the study load for each component given in EC.

Vakken:

Naam	Periode	Credits	Code
Advanced Human Neurophysiology	Periode 2	6.0	AM_1003
Experimental and clinical neuroendocrinology	Periode 2	6.0	AM_470700
Functional Brain Imaging	Periode 1	6.0	AM_470715
Psychophysiology	Periode 1	6.0	AM_470736

Msc Biomedical Sciences, compulsory courses

Vakken:

Naam	Periode	Credits	Code
Ethics in Life Sciences	Periode 3	3.0	AM_470707
Literature thesis Biomedical Sciences	Ac. Jaar (september)	9.0	AM_471135
Scientific Writing in English	Ac. Jaar (september)	3.0	AM_471023

Capita courses MSc Biomedical Science

Vakken:

Naam	Periode	Credits	Code
Caput Dilemmas in the Implementation of Public Health Programmes		3.0	AM_470565
Caput Institutionalising Participatory Approaches in the South		3.0	AM_470567
Caput Protein Structure as Molecular Basis of Disease	Ac. Jaar (september)	6.0	AM_470120
Internship Biomedical Sciences- no spec.	Ac. Jaar (september)	30.0	AM_471158

Advanced Human Neurophysiology

Vakcode	AM_1003 ()
Periode	Periode 2
Credits	6.0

Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. K. Linkenkaer Hansen
Examinator	dr. K. Linkenkaer Hansen
Docent(en)	dr. D.J.A. Smit, dr. K. Linkenkaer Hansen
Lesmethode(n)	Hoorcollege, Werkgroep, Computerpracticum
Niveau	600

Doel vak

At the end of the course the student should be able to:

1. Prepare a subject for an EEG measurement and understand acquisition settings such as sampling frequency, filters, impedance, etc.
2. Explain how the human brain generates scalp electroencephalographic (EEG) signals, both ongoing oscillations and event-related potentials (ERPs).
3. Analyze both ongoing (spontaneous) and ERP data using MATLAB toolboxes.
4. Understand the principles and give examples of these techniques as applied in various scientific and medical fields, including sleep research, brain-computer interfacing, and genetics.
5. Explain the principle of inverse modeling and outline the possibilities and limitations based on own experiences.
6. Apply state-of-the-art time-series techniques to M/EEG data and understand their interpretation as a biomarker and genetic marker for cognition and psychopathology,
7. Perform quantitative and statistical analysis of own data and use the results to make conclusions about the relation between brain activity and cognition/behavior.
8. Summarize the results of your research on a poster and present and defend the interpretation. Thus, you will acquire theoretical and practical experience with EEG.
9. Make an informed decision as to continue a specialization in M/EEG as part of his/her PhD training.

Inhoud vak

The course aims to provide you with the skills to perform an electrophysiological experiment from beginning to end. This requires highly practical skills in the preparation of subjects and use of highly sensitive/expense equipment, proficiency in the state-of-the-art signal analysis techniques, and a broad theoretical knowledge of how the human neurophysiology can be studied with the techniques of magneto- and electroencephalography. The generating mechanisms of EEG oscillations and ERPs are treated in detail, as well as the theory behind digital signal processing. This will include frequency decomposition of the EEG (Fourier analysis), time-frequency analysis (wavelet), filtering, and methods to quantify temporal and spatial correlations (i.e., Detrended Fluctuation Analysis and cross-channel synchrony, respectively).

An important component of the course is to teach you how to perform high-density EEG recordings and to analyze these signals with classical as well as more recent non-linear methods. You will work in small groups to record, analyze and present both data on EEG its cognitive/behavioral correlates at the end of the course. The importance of non-stimulus driven brain activity and cognition for brain-related disorders such as depression, dementia, insomnia or attention deficit and hyperarousal disorder is discussed.

Onderwijsvorm

The study credits amount to 168 hours of study, which are divided approximately as follows:

Activity Hours of study

Lectures 20

Self study (literature and lecture sheets) 40

Lab experiments 8

Data analysis and computer practicals 32

Group discussions (journal club preparation) 4

Plenary discussions 6

Poster preparation 18

Preparation for exams (poster and written) 40

Total 168

Toetsvorm

EEG/ERP data collection under supervision; analysis and presentation of data on research poster (40%). Written examination (60%).

Literatuur

Steven J. Luck 'An introduction to the event-related potential technique'. (Boston: The MIT press). Chapters 1, 3 and 4.

Nikulin VV, Linkenkaer-Hansen K, Nolte G, Lemm S, Müller KR, Ilmoniemi RJ, Curio G. A novel mechanism for evoked responses in the human brain. *Eur J Neurosci*. 2007;25:3146–54.

Mazaheri A, Jensen O. Asymmetric amplitude modulations of brain oscillations generate slow evoked responses. *J Neurosci* 2008;28:7781–7.

Jensen O, van Dijk H, Mazaheri A. Amplitude asymmetry as a mechanism for the generation of slow evoked responses. *Clin Neurophysiol* 2010.

Nikulin VV, Linkenkaer-Hansen K, Nolte G, Curio G. Non-zero mean and asymmetry of neuronal oscillations have different implications for evoked responses. *Clin Neurophysiol* 2010;121:186–93.

Hardstone R, Poil S-S, Schiavone G, Jansen R, Nikulin VV, Mansvelder HD, Linkenkaer-Hansen K. Detrended fluctuation analysis: A scale-free view on neuronal oscillations. *Frontiers in Physiology*. 3:450. doi:10.3389/fphys.2012.00450. 2012.

De Geus EJC (2002) Introducing genetic psychophysiology. *Biol Psychol* 61:1–10.

De Geus E (2010) From genotype to EEG endophenotype: a route for post-genomic understanding of complex psychiatric disease? *Genome Medicine* 2:1–4.

Aanbevolen voorkennis

Brein en Medicijn and/or Humane Neurofysiologie.

Doelgroep

Masters and PhD students with interest in human brain function in general and EEG methodology in particular.

Advanced Molecular Immunology and Cell Biology

Vakcode	AM_470656 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. M. van Egmond
Examinator	prof. dr. M. van Egmond
Docent(en)	Dr. M. van Egmond, K. Brouwer, prof. dr. R.E. Mebius, dr. T. van der Pouw Kraan, prof. dr. H.E. de Vries, dr. ing. S.J. van Vliet
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	500

Doel vak

To acquire insight into:

- cellular interactions within the immune system and how molecular diversity is generated to regulate immune responses.
- the various strategies of host immune responses against pathogens, and how pathogens escape proper immune responses.
- the various strategies of the host to positively or negatively affect immune responses during cancer.
- mechanisms by which the immune system regulates either immune activation or tolerance induction.
- the mechanism of cell migration within the immune system.

End terms:

Knowledge: Knowledge: At the end of the course the student is familiar with current knowledge on the (molecular) pathways involved in the induction and regulation of immune responses in health and disease.

Skills:

- The student is capable of applying the acquired knowledge and can interpret scientific literature and scientific hypotheses of each of the topics described above.
- The student is able to formulate a scientific hypothesis and can design a research proposal addressing the hypothesis.
- The student is able to present and discuss the research proposal with peers.

Inhoud vak

Immunology is a rapidly growing field of research in medicine and attracts a lot of attention for its contribution in various diseases such as infection diseases, cancer and auto-immunity. The course will give the student the opportunity to enhance the knowledge on the scientific aspects within the field of immunology. Special focus lies on the immunological processes underlying homeostasis control i.e., tolerance induction, immunity, antigen presentation and processes that lead to the development of inflammatory diseases (infection diseases through pathogens), auto-immunity (neuro-immunology) and cancer. Because this is an advanced course in the field of immunology, and will go into depth, particularly on molecular details, students should be familiar with basic immunology preferably via a previous basic training course in immunology.

Onderwijsvorm

The course covers immunological processes at the molecular level, and consists of lectures and study groups. In the latter part students will

read review articles as well as primary scientific articles on the subjects and discuss in groups opposing views on the molecular immunological processes that occur in the different stages of homeostasis and disease control. State of the art will be discussed of all topics, which will facilitate the study of scientific articles. Additionally, there is time for self study as well as time to design a research proposal, which will be presented. The first three weeks include lectures, study groups, self study and preparation and presentation of the research proposal, whereas the last week mainly covers self study and the exam. In the last week, subjects and possibilities of an internship in the field of immunology will be presented.

Contact hours with teachers and/ or coordinators: 45

Toetsvorm

A written exam at the end of week 4 includes essay ('open') and multiple choice questions (85% of grade). A minimum score of 5.5 for the written exam is required in order to pass.

The research proposal has to be presented and accounts for 15% of the grade.

Literatuur

Lectures, reviews and scientific papers are part of the material that covers the exam.

Titles reviews and scientific papers (some changes may occur, final list will be posted on BB)

Reviews

1. Rossi M, Young JW. Human dendritic cells: potent antigen-presenting cells at the crossroads of innate and adaptive immunity. *J Immunol*. 2005 Aug 1;175(3):1373-81.
2. Sallusto F, Mackay CR. Chemoattractants and their receptors in homeostasis and inflammation. *Curr Opin Immunol*. 2004 Dec;16(6):724-31.
3. Kumar H, Kawai T, Akira S. Pathogen recognition by the innate immune system. *Int Rev Immunol*. 2011 Feb;30(1):16-34.
4. van de Pavert SA, Mebius RE. New insights into the development of lymphoid tissues. *Nat Rev Immunol*. 2010 Sep;10(9):664-74.
5. De Libero G et al., How the immune system detects lipid antigens. *Prog Lipid Res*. 2010 Apr;49(2):120-7. doi: 10.1016/j.plipres.2009.10.002. Epub 2009 Oct 24.
6. Surana NK, Kasper DL., The yin yang of bacterial polysaccharides: lessons learned from *B. fragilis* PSA. *Immunol Rev*. 2012 Jan;245(1):13-26.
7. Abbott NJ, Rönnbäck L, Hansson E. Astrocyte-endothelial interactions at the blood-brain barrier. *Nat Rev Neurosci*. 2006 Jan;7(1):41-53.
8. Bevan MJ. Helping the CD8(+) T-cell response. *Nat Rev Immunol*. 2004 Aug;4(8):595-602.
9. Drew M. Pardoll. The blockade of immune checkpoints in cancer immunotherapy. *Nature Reviews Cancer* 12, 252-264 (2012)
10. Hansson GK, Libby P. The immune response in atherosclerosis: a double-edged sword. *Nat Rev Immunol*. 2006 Jul;6(7):508-19.
11. Schirmer SH, van Nooijen FC, Piek JJ, van Royen N. Stimulation of collateral artery growth: travelling further down the road to clinical application. *Heart*. 2009 Mar;95(3):191-7.

Research articles

1. Marsland BJ, Bättig P, Bauer M, Ruedl C, Lässig U, Beerli RR,

Dietmeier K, Ivanova L, Pfister T, Vogt L, Nakano H, Nembrini C, Saudan P, Kopf M, Bachmann MF. CCL19 and CCL21 induce a potent proinflammatory differentiation program in licensed dendritic cells.

2. Joffre OP, Sancho D, Zelenay S, Keller AM, Reis e Sousa C. Efficient and versatile manipulation of the peripheral CD4+ T-cell compartment by antigen targeting to DNGR-1/CLEC9A. *Eur J Immunol*. 2010 May;40(5):1255-65.

3. Rangel-Moreno J, Carragher DM, de la Luz Garcia-Hernandez M, Hwang JY, Kusser K, Hartson L, Kolls JK, Khader SA, Randall TD. The development of inducible bronchus-associated lymphoid tissue depends on IL-17. *Nat Immunol*. 2011 Jun 12;12(7):639-46.

4. Reboldi A. et al., C-C chemokine receptor 6-regulated entry of TH-17 cells into the CNS through the choroid plexus is required for the initiation of EAE. *Nat Immunol*. 2009 May;10(5):514-23. doi: 10.1038/ni.1716. Epub 2009 Mar 22.

5. Feau S, Arens R, Togher S, Schoenberger SP. Autocrine IL-2 is required for secondary population expansion of CD8(+) memory T cells. *Nat Immunol*. 2011 Jul 31;12(9):908-13.

6. Sierra JR, Corso S, Caione L, Cepero V, Conrotto P, Cignetti A, Piacibello W, Kumanogoh A, Kikutani H, Comoglio PM, Tamagnone L, Giordano S. Tumor angiogenesis and progression are enhanced by Sema4D produced by tumor-associated macrophages. *J Exp Med*. 2008 Jul 7;205(7):1673-85.

7. Medina RJ, O'Neill CL, Sweeney M, Guduric-Fuchs J, Gardiner TA, Simpson DA, Stitt AW.

Molecular analysis of endothelial progenitor cell (EPC) subtypes reveals two distinct cell populations with different identities. *BMC Med Genomics*. 2010 May 13;3:18.

8. Coffelt SB, Lewis CE, Naldini L, Brown JM, Ferrara N, De Palma M. Elusive identities and overlapping phenotypes of proangiogenic myeloid cells in tumors. *Am J Pathol*. 2010 Apr;176(4):1564-76.

Vereiste voorkennis

Solid knowledge on basic immunology is compulsory before the start of the course.

Aanbevolen voorkennis

A bachelor's course immunology is recommended.

Doelgroep

Students with a keen interest to study immunological processes that form a basis for a variety of occurrences of diseases. In particular those that cover the interaction between host-pathogen, host-tumor and homeostatic control.

Overige informatie

Study groups and active participation are compulsory. A substitution assignment is required when one or more workshops have not been attended, or when participation is judged as unsatisfactory.

Analysis of Governmental Policy

Vakcode	AM_470571 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen

Coördinator	drs. R.M. Edelenbosch MA
Examinator	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.

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
Examinator	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

Caput Dilemmas in the Implementation of Public Health Programmes

Vakcode	AM_470565 ()
Credits	3.0

Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen

Doel vak

- The student has acquired in-dept insight in organization, management and policy in the field of Public Health in the South, with a specific focus on the implementation of vaccines programmes
- Has acquired insight in the constraints in the implementation of Public Health programmes i.e. vaccination programmes in the South
- Has applied the acquired insight in the implementation of results and interpretation and to evaluate the efficacy of vaccines programmes.
- Has assessed constructively and systematically strategies to solve the constraints and to improve the efficacy of vaccination programmes through national and international organization

Inhoud vak

This caput will increase the student's knowledge in the North- South relation and particularly on the implementation of Public Health Programmes in the South with focus on an international context.

Furthermore, the course will give an overall overview of the organization and policy strategies of organizations involved in the implementation of public health programmes which directly is linked with the containment course.

Special attention is given to analyzing the dilemmas and challenges in public health and to generate ideas for future development. The analysis will focus on i) the experiences in working in the field and community based health programmes e. g. vaccination programmes; ii) the constraints and opportunities of the various implementation strategies; iii) methodological aspects of inter disciplinary research; iv) monitoring and evaluation of public health programmes; v) communication strategies to policymakers, professionals and the general public.

Onderwijsvorm

This theoretical course comprises self study and three discussion meetings. After a short introduction the student has to study various scientific articles that are then critically analyzed and discussed in a subsequent meeting.

Toetsvorm

Written of oral exam and individual assessment through evaluation assignments

Literatuur

Selected chapters and scientific articles.

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

Self study. Course co-ordinator: E. Ruitenber.
For information and application: anna.van.luijn@falw.vu.nl

Caput Institutionalising Participatory Approaches in the South

Vakcode	AM_470567 ()
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Credits	3.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. M.B.M. Zweekhorst
Examinator	dr. M.B.M. Zweekhorst

Doel vak

- To develop a detailed understanding of the importance of participation strategies for sustainable development
- To understand the difficulties that have been identified for institutionalising interactive approaches within existing organisations
- To obtain insight into different strategies to institutionalize interactive approaches.
- To acquire knowledge on the learning organisation.

Inhoud vak

During the past three decades participation has become increasingly visible as an issue in development. It is recognized that participation is a key element in poverty eradication and sustainable development. Methodologies to enhance participation are now commonly used in development projects and 'participation' has become a development orthodoxy. However, it is one thing to acknowledge the effectiveness of participatory approaches, but another to apply these approaches consistently over longer periods of time. This requires institutionalisation of these approaches within the organisations concerned, so as to build the necessary capacity. Most organisations are not well adapted to the application of participatory approaches. Some organisational change is therefore likely to be necessary if participatory approaches are to be institutionalised successfully. In this theoretical course you study in depth scientific literature about various theoretical concepts and practical experiences of institutionalisation processes of interactive approaches that were undertaken by organisations in the South.

Onderwijsvorm

This theoretical course comprises self study. After a short introduction you study various scientific articles that are then critically analyzed.

Toetsvorm

Individual assessment through an assignment

Literatuur

Selected scientific articles.

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

Self study. Basic knowledge on organisation and management is required. For more information and application: anna.van.luijn@falw.vu.nl

Caput Protein Structure as Molecular Basis of Disease

Vakcode	AM_470120 ()
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. D. Bald
Examinator	dr. D. Bald
Niveau	500

Doel vak

Overview of recent advances in research of molecular disease based on protein structure;

Final attainment level:

The student has insight into the relation between protein structure/ (mal-) function;

The student has insight into the relation protein (mal)- function/disease.

The student can screen and evaluate scientific literature and present a structured review of recent advances in a relevant field/topic.

Inhoud vak

Suggested topics are:

- Antibiotic action
- Antibiotic Resistance
- Cancer/p53
- Anti-Influenza drugs
- Tuberculosis drug targets
- Anti-aids drugs

Feel free to suggest other topics related to protein structure/function, please ask the lecturer for more information.

Onderwijsvorm

You receive several original publications on a recent topic in protein structure/disease (see above) from the lecturer. You study these papers and collect more information (data-base search etc.) about research in the field. Finally you can either write up your results in a review-style paper or give an oral presentation.

Toetsvorm

Oral or written presentation (choice)

Literatuur

Literature depends on the topic chosen by the student. Literature search in self-study.

Doelgroep

Masters students Biomolecular Sciences, Biomedical Sciences, Biology, Pharmaceutical Sciences, Medical Natural Sciences

Intekenprocedure

Send email to Caput coordinator concerning further information and registration

Overige informatie

This caput can be done in the period from April to June 2015.

Clinical Aspects of Heart and Circulation

Vakcode	M_CCLINBIO09 (3120000)
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	VUmc
Coördinator	dr. O. Kamp
Examinator	dr. O. Kamp
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	400

Doel vak

This course focuses on the basic principles and clinical aspects of normal cardiac and circulatory function and dysfunction and the development of heart failure. Special attention will be given to the biophysical and clinical aspects of imaging.

Inhoud vak

The following topics will be addressed: Cardiac excitation and contraction, physics of heart and circulation, hem rheology and fluid dynamics, Coronary artery disease: ischemic syndromes; Heart failure: Pathophysiology, diagnosis, treatment and prognosis; Hypertension and other risk factors of Coronary Artery Disease: Clinical diagnosis, treatment and complications; Inflammation of the heart: Pericarditis, myocarditis and endocarditis; Mitral & aortic valve disease; Aortic and peripheral vascular disease: Clinical spectrum, diagnosis and treatment; Pulmonary hypertension; Clinical recognition of supra- and ventricular arrhythmias; Cardiovascular positron emission tomography, MRI, Ultrasound; Implants: pacemakers/defibrillators; Cardiac Resynchronization Therapy (CRT).

Onderwijsvorm

Lectures, working groups, assignments

Toetsvorm

Written exam and assignments

Literatuur

Book: Cardiology, Crawford-Di Marco-Paulus 3rd Ed (recommended) syllabus including relevant articles.

Intekenprocedure

Students can register for this course and examinations via vunet.vu.nl (under My study, register for courses and exams). The general VU registration rules apply. Information on registration deadlines can be found in VUnet. Please note that the general VU rules are strict, both for booking of the classes and (resit-)exams.

Clinical development and clinical trials

Vakcode	AM_470585 ()
Periode	Periode 3
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. H.J.H.M. Claassen
Examinator	prof. dr. H.J.H.M. Claassen
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

Clinical Immunology

Vakcode	AM_470655 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. T. van der Pouw Kraan
Examinator	dr. T. van der Pouw Kraan
Docent(en)	K. Brouwer, dr. C.J.J. Mulder, dr. T. van der Pouw Kraan, dr. B.W. van Oosten, dr. J. Killestein, prof. dr. P. van der Valk, dr. ing. S.J. van Vliet, dr. E.J.G. Peters, H.E. Hulst
Lesmethode(n)	Hoorcollege
Niveau	500

Doel vak

To understand immunopathogenic processes that play a role in the onset and chronicity of three immunological diseases, which cover auto-immunity and infectious disease, such as celiac disease, multiple sclerosis (MS) and AIDS.

To acquire insight in both clinical parameters as well as basic scientific principles that play a role in these diseases.

To acquire insights in the currently used treatments to reduce disease activity.

To understand the mechanism by which the immune system regulates these diseases, and how one could modify immune response to the benefit of the patient.

To apply the acquired knowledge of scientific literature and

scientific hypotheses of each of the topics described above by presenting it to their fellow students.

Inhoud vak

During the course three immunological diseases will be discussed: celiac disease, multiple sclerosis (MS) and AIDS, each for the duration of one week. Each week will start with a clinical introduction into the features of the disease by a practicing clinician at the VUmc, who illustrates the symptoms in patients that have these diseases. Questions will be formulated and within small groups students will formulate answers through literature search. During the week more lectures will be given on the immunological mechanisms that play a role during these complex diseases. These lectures highlight molecular immunological tools used, as well as novel strategies such as genomics-proteomics profiling of the disease, the use of animal models that mimic disease, as well as vaccine development and treatment methodology of the diseases. Through self study and searching literature students will try to answer the questions via a written essay of 2-3 pages and an oral presentation for their fellow students, which is scheduled at each Friday.

Onderwijsvorm

The course covers immunological processes as well as clinical parameters both at the molecular as well as the cellular level and will discuss both innate and adaptive immune responses. The course consists of lectures, selfstudy, and workshops. Lectures and workshops both are compulsory. In the latter part students will present their answers on questions based on literature searching and reading of reviews as well as the lectures. For the duration of one week one disease will be discussed, whereas the last week covers mainly selfstudy and the exam.

Contact hours

19 hours lectures

15 hours workgroups and presentations

Toetsvorm

Lectures and workshops are compulsory and form part of the material that covers the exam. Active participation in discussion is part of the appraisal (presentations of answers to assay questions account for 10% of the exam). Written exam at the end of week 4 include 15 essay questions (90%).

Literatuur

The immune system by P. Parham 3th edition, Immunobiology by Janeway 7th edition, Case Studies in Immunology: A Clinical Companion (by Geha 6th edition), including a handout on BB which contains recent reviews specialized on the immunological diseases discussed.

Vereiste voorkennis

Bachelor's course Immunology

Doelgroep

MSc students with a keen interest to study immunological processes within the complexity of diseases such as allergy, multiple sclerosis and AIDS.

Overige informatie

External lecturers:

Dr. J. Borghans (UMCU)

Prof. dr. F. Koning (LUMC)

Dr. J. Samsom (ErasmusMC)

Dr. W.A. Paxton (AMC)

Prof. dr. T.B.H. Geijtenbeek (AMC)

Communication, Organization and Management

Vakcode	AM_470572 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. T.P. Groen
Examinator	dr. T.P. Groen
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

Complex Trait Genetics

Vakcode	AM_470733 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. D.I. Boomsma
Examinator	prof. dr. D.I. Boomsma
Docent(en)	prof. dr. D.I. Boomsma
Lesmethode(n)	Hoorcollege
Niveau	500

Doel vak

Provide the theoretical background into population and biometrical genetics so that students gain an understanding of the way the genome contributes to human variation in behavior, health and disease.

Inhoud vak

Quantitative genetics is concerned with the inheritance of those differences between individuals that are of degree rather than of kind (quantitative rather than qualitative). Such differences are seen for most complex human traits (e.g. depression, cognitive abilities or attention problems).

This course aims to provide an understanding of the inheritance of quantitative differences in behavior, psychiatric disorders, endophenotypes (e.g. blood pressure or brain volumes) underlying disease traits (e.g. hypertension or schizophrenia).

Quantitative differences, as far as they are inherited, depend on genes with on average small effects and are usually influenced by gene differences at many loci. Consequently these genes cannot be identified

by Mendelian segregation ratios (though they are subject to the laws of Mendelian transmission).

The methods of quantitative genetics differ in from those employed in Mendelian genetics and have in the past few years undergone a revolution, because we can now assess millions of gene variants and associate those with human traits.

The extension of Mendelian genetics into quantitative genetics will be made in two stages: the genetic properties of populations (population genetics) and the inheritance of measurements (biometrical genetics). Quantitative genetics is now merging with molecular genetics and the last part of this course will be devoted to methods for the localization and characterization of genes causing quantitative variation, focusing on recent developments using genome wide association (GWA) analysis.

Onderwijsvorm

Combined lectures and work groups, twice 4 hours per week.

Toetsvorm

Course grades will be based on 3 assignments; for ~40%, 20% and 40% of grades:

1) Read papers (references provided in class) and write a short essay about current issues / state-of-the-art in human genetics (focus on genetic association studies). Select one empirical paper; (try to) read it.

Indicate what is unclear to you. At the end of this course you will be asked to review your own essay and then indicate what you now understand better than before.

2) Problems from the book to be assigned after each lecture (about 4 or 5) as home work before the next class. Students will be asked to present the solutions to the problems in class and part of grading depends on how well solutions are presented.

3) Final assignment: oral presentations on a research topic; topics can be chosen from a list of papers or book chapters.

Literatuur

Book: Falconer & Mackay: Introduction to Quantitative Genetics (1996) and a series of papers, the final list of papers will change as new papers come out, the list below serves as an indication.

4 papers / commentaries from the New England J of Medicine 23 april, 2009:

J. Hardy and A. Singleton: Current Concepts: Genomewide Association Studies and Human Disease

D. B. Goldstein: Common Genetic Variation and Human Traits

J. N. Hirschhorn: Genomewide Association Studies — Illuminating Biologic Pathways

P. Kraft and D. J. Hunter: Genetic Risk Prediction — Are We There Yet?

Recent review papers

Visscher PM, Brown MA, McCarthy MI, Yang J. Five years of GWAS discovery. *Am J Hum Genet.* 2012 ;90(1):7-24.

Hirschhorn JN, Gajdos ZK. Genome-wide association studies: results from the first few years and potential implications for clinical medicine.

Annu Rev Med. 2011 18;62:11-24.

Recent gene finding papers

*Davies G, et al. Genome-wide association studies establish that human intelligence is highly heritable and polygenic. *Mol Psychiatry*, 16 (10):996-1005, 2011

* Teslovich TM, et al. Biological, clinical and population relevance of 95 loci for blood lipids. Nature. 466(7307): 707-13, 2010

* Lango Allen H, et al.. Hundreds of variants clustered in genomic loci and biological pathways affect human height. Nature. 467(7317):832-8, 2010

* Scott RA,. Large-scale association analyses identify new loci influencing glycemic traits and provide insight into the underlying biological pathways. Nat Genet. 44(9):991-1005, 2012

Vereiste voorkennis

General knowledge of human and quantitative genetics. When in doubt, ask the course coordinator.

Aanbevolen voorkennis

General knowledge of human and quantitative genetics. When in doubt, contact the course coordinator (Dorret Boomsma: di.boomsma@vu.nl).

Doelgroep

MA Students, PhD-students, postdocs who are interested in the theoretical basis of research on the genetic origin of complex features of man.

Overige informatie

There will be 2 guest lectures on topics that have emerged after the last edition of the book was published; on fields like epegenetics. Furthermore, it is expected from students that they will join a couple of high-level meetings in the Netherlands, such as from BBRMI-NL.

Containment Strategies of Infectious Diseases in Global Context

Vakcode	AM_470127 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. J.F. van den Bosch
Examinator	dr. D.R. Essink
Docent(en)	dr. D.R. Essink, prof. dr. P.R. Klatser, prof. dr. J.F. van den Bosch
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	500

Doel vak

The endpoint of this course is that the student

- Has acquired in-depth theoretical and practical knowledge in relation to health intervention strategies for infectious diseases.
- Has acquired insights in various infectious diseases and characteristics in relation to containment strategies.
- Has acquired insight into the role of international institutions, such as the WHO, governmental advisory bodies, relevant professionals, executing institutions, NGOs and communities in designing and carrying out health interventions.
- Understands which barriers are important when implementing containment strategies of infectious diseases, with a focus on vaccination programs.

- Has acquired insight in theoretical concepts and methods to interpret results, evaluations and the effectiveness of programs.
- Has learned to develop and apply risk assessment, risk management, and risk communication methods.
- Has learned and practiced interdisciplinary methods and techniques to plan health interventions at community level in an interactive way.

Inhoud vak

This course covers developments in intervention strategies used to address health needs in a global context. Containment strategies of infectious diseases, in particular vaccination programmes, alert systems and intervention strategies, provide specific areas of attention. The containment strategies to be discussed include programmes for known infections (including vaccination strategies and in case of absence of a vaccine, diagnosis and treatment strategies) and emerging infections (including isolation, prevention and communication strategies).

The student learns how to analyze bottlenecks and opportunities of the various strategies, how to interpret the results and to evaluate the implementation of programmes.

In addition, the student will take part in a group assignment on how to design containment strategies at community level in an interactive way, for e.g. tuberculosis, polio, rabies, malaria, HIV/AIDS, Ebola, etc. A presentation and writing of an essay will be part of the group assignment.

Onderwijsvorm

Lectures, group assignment, presentation, essay, self-study.

Basic background knowledge will be provided by VU lecturers, whereas relevant guest lecturers will present practical field examples.

Group assignment attendance is compulsory.

Contact hours: lectures 34 hrs, group work 8 hrs.

Self-study approx. 80 hrs.

Toetsvorm

Individual exam (60%) and group assignment presentation and essay (40%).

Both parts must at least be sufficient (6 or higher)

Literatuur

R. Webber, 2009. Communicable Disease Epidemiology and Control. 3rd Edition. CAB International, UK and USA. ISBN 978-1-84593-504-7.

Lecturers may make further readings available on Blackboard.

Vereiste voorkennis

Basic knowledge about the pathogenesis of infectious diseases, microbiology and immunology

Aanbevolen voorkennis

Minor course AB_1046 "Infectious Diseases and Vaccine Development"

Doelgroep

Compulsory course within the Master differentiation International Public Health; optional course for students in other differentiations of the Masters Health Sciences, Biomedical Sciences, and Management, Policy Analysis and Entrepreneurship in Health and Life Sciences. Students from other backgrounds, please contact our secretariat for further information at secretariaat.athena@vu.nl

Intekenprocedure

Enrollment through Blackboard.

Overige informatie

VU lecturers:

Prof. dr. Han van den Bosch

Prof. dr. Paul Klatser

Dr. Dirk Essink

Dr Bernard Ganter

Guest lecturers:

Dr. Jim van Steenberghe (RIVM/LUMC)

Dr Frank Cobelens (KNCV)

Dr. Richard Anthony (Royal Tropical Institute)

Prof. dr. Maarten Postma (RUG)

Dr. Kitty Maassen (RIVM)

Dr. Koert Ritmeijer (MSF)

Prof. dr. Robert Sauerwein (UMC Nijmegen)

Prof. dr. Cees Hamelink (VU)

Prof. dr. Guus Rimmelzwaan (EMC Rotterdam)

Dr. Hans Zaaijer (Sanguin)

Prof. dr. Jan Kluytmans (VUMC)

Disability and Development

Vakcode	AM_470588 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	H.B. Miranda Galarza MSc
Examinator	H.B. Miranda Galarza 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,
- Disability-relevant research methods, including examples of disability research
- An introduction to community-based rehabilitation and disability inclusive development.

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

For more information contact dr. Christine Dedding (c.dedding@vu.nl) or dr. Beatriz Miranda Galarza (b.mirandagalarza@vu.nl)

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
Examinator	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

Ethics in Life Sciences

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

Doel vak

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

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

Inhoud vak

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

Onderwijsvorm

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

The total study time is 80 hours.

The different elements have the following study time:

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

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

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

Toetsvorm

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

Literatuur

Available on Blackboard

Vereiste voorkennis

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

Doelgroep

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

Overige informatie

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

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

Experimental and clinical neuroendocrinology

Vakcode	AM_470700 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. C.B. Lambalk
Examinator	dr. C.B. Lambalk
Docent(en)	dr. J.B. Deijen, B.P.C. Kreukels BSc, dr. J. Rotteveel, dr. C.B. Lambalk, dr. M.M. van Weissenbruch, prof. dr. M.A. Blankenstein, prof. dr. M. den Heijer
Lesmethode(n)	Hoorcollege, Practicum
Niveau	500

Doel vak

The aim of the course is to provide the students not only with a solid basis in the fundamentals of neuroendocrinology, but also with knowledge of recent developments and current research in this field of clinical neurosciences.

Inhoud vak

The course includes an understanding of structure and function of the hypothalamo- pituitary axis in relation to growth, stress, reproduction as well as to autonomic- endocrine and immune- endocrine interactions. Diseases of the hypothalamus and pituitary will be discussed, with special emphasis on central regulation of growth, puberty, reproduction, obesity and stress, sexual orientation and gender identity, taking both an experimental and clinical point of view.

Onderwijsvorm

Lectures 24 hrs (appr)

Outpatient clinics 6 hrs

Research tutorials 10 hrs (appr)

Toetsvorm

Written examination; open questions.

Literatuur

Kandel ER, Schwartz JH, Jessell TM Principles of Neural Science, 2012, 5th edition, McGraw Hill, ISBN 0071390111. (Ch 47) Selected papers to be handed out during the course.

Vereiste voorkennis

BSc Biology, BSc Medical Biology, BA Biological Psychology, BA Neuropsychology

Overige informatie

For further information, please contact mw. M. Evers (M.Evers@vumc.nl)

Maximum nr. of participants 25.

Functional Brain Imaging

Vakcode	AM_470715 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. P.J.W. Pouwels
Examinator	dr. P.J.W. Pouwels
Lesmethode(n)	Computerpracticum, Hoorcollege
Niveau	500

Doel vak

The student will learn about the most important brain imaging techniques, the principles on which they are based and practical applications in research and patient care. Quite some emphasis on physics and mathematics will be given during the lectures. However, the goal is not to examine the students on this knowledge, but to provide sufficient background to develop a critical and scientific attitude towards imaging techniques. The main focus for the students will be to translate this knowledge into the potential use of techniques in neuroscience.

Inhoud vak

In this course the structure and function of the brain will be studied on the mesoscopic and macroscopic level. Three approaches can be distinguished: neurophysiological techniques (EEG, MEG), neuroradiological techniques (MRI, fMRI, MRS) and techniques which involve the use of radio active ligands (SPECT, PET). These techniques will be discussed in relation to ongoing research at the VU University Medical Centre (memory and cognitive dysfunction; white matter diseases, fear and depression; methodological innovation of brain imaging techniques).

Onderwijsvorm

The basic principles and several applications of all techniques will be presented in a series of lectures mainly scheduled during the first 3 weeks (almost full-time, attendance is required). Small groups will

discuss particular aspects in more detail. During the course, visits to the departments involved in imaging will be arranged. Hands-on experience of analysis methods is provided in computer practicals.

Toetsvorm

Individual written exam (50% of final mark)

Team presentation about a functional brain imaging experiment concerning a neurological disorder / neuroscientific problem. (50% of final mark)

Literatuur

- Bullmore E, Sporns O: Complex brain networks: graph theoretical analysis of structural and functional systems. *Nat Rev Neurosci*. 2009 Mar;10(3):186-98.
- Gong G, He Y, Evans AC: Brain connectivity: gender makes a difference. *Neuroscientist*. 2011 Oct;17(5):575-91
- Stam CJ: Characterization of anatomical and functional connectivity in the brain: a complex networks perspective. *Int J Psychophysiol*. 2010 Sep;77(3):186-94.
- Varela F et al: The brainweb: phase synchronization and large-scale integration. *Nat Rev Neurosci*. 2001 Apr;2(4):229-39.
- Devlin H et al: Introduction to fMRI.
<http://www.fmrib.ox.ac.uk/education/fmri/fmri/introduction-to-fmri>
- Matthews PM et al: Applications of fMRI in translational medicine and clinical practice. *Nat Rev Neurosci*. 2006 Sep;7(9):732-44.
- Lazar M: Mapping brain anatomical connectivity using white matter tractography. *NMR Biomed*. 2010 Aug;23(7):821-35.
- Beaulieu C. The basis of anisotropic water diffusion in the nervous system - a technical review. *NMR Biomed*. 2002 Nov-Dec;15(7-8):435-55
- Blokland JA et al: Positron emission tomography: a technical introduction for clinicians. *Eur J Radiol*. 2002 Oct;44(1):70-5.
- Klunk WE et al: Imaging brain amyloid in Alzheimer's disease with Pittsburgh Compound-B. *Ann Neurol*. 2004 Mar;55(3):306-19.
- Lammertsma AA: Radioligand studies: imaging and quantitative analysis. *Eur Neuropsychopharmacol*. 2002 Dec;12(6):513-6.
- Phelps ME: Positron emission tomography provides molecular imaging of biological processes. *Proc Natl Acad Sci U S A*. 2000 Aug 1;97(16):9226-33.
- Baillet S et al: Electromagnetic brain mapping. *IEEE Signal Processing Magazine* 2001 Nov;18(6):14-30.
- Hari R, Salmelin R: Human cortical oscillations: a neuromagnetic view through the skull. *Trends Neurosci*. 1997 Jan;20(1):44-9.
- Hillebrand A et al: A new approach to neuroimaging with magnetoencephalography. *Hum Brain Mapp*. 2005 Jun;25(2):199-211.

Vereiste voorkennis

Finished 1st year Master of Neurosciences or finished 1st year Master of Biomedical Sciences.

Doelgroep

Students following 2nd year master-tracks Clinical Neurosciences or Psychophysiology.

Students with other background, please first contact coordinator.

Overige informatie

There is a maximum number of students.

This means that students other than the target group should first contact coordinator.

Taught in English.

For further information, please contact dr. P.J.W. Pouwels
(pjw.pouwels@vumc.nl)

Genomic Data Analysis

Vakcode	AM_1008 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. P. van Nierop
Examinator	dr. P. van Nierop
Docent(en)	dr. P. van Nierop, dr. Z. Bochdanovits
Lesmethode(n)	Hoorcollege, Computerpracticum
Niveau	500

Doel vak

To provide students with basic knowledge and skills to independently design, execute and explain the results of data analysis in the context of a genomics/proteomics experiment.

FINAL ATTAINMENT LEVELS :

- (i) Graduated students have acquired the necessary research skills to plan, execute, and reflect on elementary steps in data processing, statistical evaluation, and representation of results of a genomics experiment;
- (ii) students have knowledge of the principles behind analysis of protein and DNA sequence information;
- (iii) students have basic programming skills in the R programming language

Inhoud vak

The course will address various aspects of bioinformatics analysis of the genome and will address the following topics:

- Gene expression analysis: this section of the course deals with stages in data analysis that are associated with large scale transcriptomics data (microarray experiment). Consecutive stages of data analysis, i.e., experimental design (as far as relevant for data analysis), data preprocessing, normalization, statistical evaluation, and the identification of relevant gene groups, are discussed. At each stage specific characteristics of large scale genomics experiments that impair a straightforward interpretation of results are highlighted and alternative analysis strategies are discussed. The lectures are accompanied by computer practicals where theory is put into practice and the basic practical skills are acquired for genomics data analysis and representation in the R programming language. The theoretical and practical skills are applicable to any 'omics' (genomics, proteomics, metabolomics) experiment.
- Analysis of biological sequences: this section of the course teaches the fundamentals of mining of information on DNA and protein sequences relevant for molecular biology research. Special attention is given to the principle of molecular evolution and the translation thereof into algorithms for sequence analysis. Topics of sequence alignment, sequence database searching, and phylogenetic analysis will be discussed, and are accompanied by computer practicals that provide insight into sequence

analysis algorithms as well as familiarize students with popular sequence analysis tools such as BLAST and ClustalW.

Onderwijsvorm

Lectures (20 hr), practicals (15 hr)

Toetsvorm

Written exam(60%), microarray data analysis assignment (20%), sequence analysis assignment (20%)

Literatuur

Dov Stelkel, Microarray bioinformatics, 2003, Cambridge University Press, ISBN 052152587X

David W Mount, Bioinformatics: sequence and genome analysis, 2004, 2nd edition, Cold Spring Harbor Laboratory Press, ISBN 0879697121

Vereiste voorkennis

Bachelor Biology, Biomedical Sciences, Psychology with profile Biological Psychology or Neuropsychology, Neurogenomics course.

Doelgroep

The course provides essential body of knowledge and skills to students that pursue a career in Life Sciences at the molecular level (genomics, proteomics, metabolomics).

Overige informatie

For further information, please contact dr. P. van Nierop (p.van.nierop@vu.nl)

Health Geography

Vakcode	AM_470094 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. ir. J. van Vliet
Examinator	dr. ir. J. van Vliet
Docent(en)	prof. dr. H.J. Scholten
Lesmethode(n)	Hoorcollege, Computerpracticum
Niveau	400

Doel vak

After the course the student can answer basic questions concerning specific health geography issues, by using geographical data and analysis (GIS) techniques. The student:

- has a critical appreciation of spatial perspectives in the geography of health;
- has practical experience in the use of GIS software and analysis tools to solve the spatial component health geography issues;
- can document and communicate the use of geodata and spatial procedures in written form and using flowcharts and meaningful clear maps.

Inhoud vak

This course covers the spatial dimension of health issues and teaches methodology and use of an essential tool for health geographers: Geographical Information Systems (GIS).

Location and time determine the variation in the social and environmental factors that are essential for the spatial development, distribution, treatment and prevention of diseases and health problems. Unsurprising, since the late nineties the use of geodata and GIS has become more and more standard in the different health disciplines that study the aforementioned spatial relationships, such as environmental health and disease ecology. Or as Cromley and MacLafferty (2011) put it: "GIS, as a means of exploring health problems and finding ways to address them, has taken its place in the conceptual and methodological foundations of public health". Next to GIS applications in disease surveillance and risk analysis, GIS is also increasingly used in applications for health access and planning and for community health profiling.

To apply geographically based GIS tools and methods to the study of health, disease, and health care, in a sound and responsible way, requires expert knowledge and skills from multiple disciplines. This course offers the necessary basic skills and knowledge concerning the geographic data, tools and methods from the geographic disciplines. Your health studies should offer most of the necessary skills and knowledge from the health related disciplines. This implies that this course will start as a basic GIS course, but with case studies and geodata relevant for your discipline. As the course proceeds the background disciplines will merge more and more together into the discipline of health geography, maintaining however a strong focus on geodata, GIS and spatial analysis.

Onderwijsvorm

Lectures, guest lectures, and supervised computer labs. The latter are core of the course. Each week consists of 14 contact hours and 26 self study hours.

Toetsvorm

The final mark of this course is composed of two parts:

- 1) Exam: the exam is held in a computer room and consists of questions that test your practical skills in using (Arc)GIS as well as questions that test your understanding of spatial perspectives in health (course lectures and literature).
- 2) and Self Assessed Exercises (SAE).

The exam and SAE's make up 100% of the end mark. For the exam, the maximum score you can obtain is 8 points; handing in the SAE's (1 – 8) in time and complete counts for 2 points.

Literatuur

To be announced

Vereiste voorkennis

Proven affinity with Information Technology

Doelgroep

MSc students with basic training in health sciences and/or nutrition. The course is a component of the MSc Management, Policy Analysis and Entrepreneurship in Health and Life Sciences programme and of the MSc Biomedical Sciences. The course is open as well for students of the differentiation programme Infectious diseases and Public Health in the

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
Examinator	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

The student;

- Is able to describe, understand and apply human rights concepts in a global context
- Develops a deeper understanding and A critical attitude towards scientific literature in the field of health, globalization and human rights in order to formulate soundly argued positions
- Is able to create his/her own vision with regard to the socio-cultural dimensions of human rights values in relation to public health
- Is able to apply methods of human rights assessment in relation to innovations in health care
- Demonstrates the ability to write and present according to academic standards

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):

Cees Hamelink

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 Wanda Konijn (w.s.konijn@vu.nl) or Anna van Luijn (a.van.luijn@vu.nl)

History of Life Sciences

Vakcode	AM_471017 ()
Periode	Periode 3
Credits	3.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. I.H. Stamhuis
Examinator	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.

Immunity and Disease

Vakcode	AM_1031 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. I.M.W. van Hoogstraten
Examinator	dr. I.M.W. van Hoogstraten
Docent(en)	dr. I.M.W. van Hoogstraten
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	600

Doel vak

- Expanding knowledge obtained during the introductory course on immunology, focusing on several immunological disease processes including immunodeficiency, hypersensitivities/allergies, autoimmunity, (prevention of) infectious disease, graft rejection, graft versus host reactions and tumor immunology.
- Training in how to study primary and secondary immunological literature on selected immune disorders.
- Introduction to critical research questions regarding immunological aspects of various diseases.

Final attainment levels: The student should be able to

- Explain in depth how and to which extent immune defence mechanisms normally operate, and are redistributed in the immune disease processes listed above.
- Point out diagnostic methodologies providing the most relevant information for diagnosis and selection of therapeutic interventions.
- Summarize pros and cons of preventive and therapeutic measures.

Inhoud vak

Parham's 'The Immune System' (3rd ed.), also used for the introductory course. After a short repetition of the basics of the immune system (chapters 1 - 9), the chapters 10 – 16 focussing on mechanisms of infectious diseases, vaccination, immunodeficiencies, hypersensitivities and allergies, autoimmune diseases, graft rejection, graft versus host disease, tumor immunology, with attention to therapeutic and technical issues. Additional course content (literature and lectures on research models) will be placed on Blackboard.

Onderwijsvorm

Independent study (approx. 120 hrs), complemented with training sessions.

First, during the initial lecture knowledge on the first 9 chapters will be refreshed. Subsequently, the chapters 10 - 16 of Parham (3rd ed.) and research models in immunity and disease will be lectured and discussed. In addition, small-scale working group sessions are scheduled to provide highly interactive discussions regarding selected recent literature in order to highlight cutting edge research questions (2 x 3 hours).

Toetsvorm

The course will be closed off with a written exam based on a combination of multiple choice (about literature studies and research models) and open questions (about issues of the book and lectures). This will determine 90% of the final grade; the additional 10% will be determined by the participation in the literature sessions and research model sessions.

The re-exam takes place annually in January.

Literatuur

The immune system, Parham, 3rd edition (ISBN 9780815341468). Complementary literature on selected topics will be provided on Blackboard.

Vereiste voorkennis

Not relevant

Aanbevolen voorkennis

Bachelor's course Immunology

Doelgroep

MSc students with a keen interest to study the immunopathology and (potential) therapeutical approaches of a broad range of immunological diseases.

Overige informatie

Partner coordinator: dr. M. Ulrich

Teaching staff:

Prof.dr. W. Bitter; dr. H. Bontkes; dr. S. Cillessen;
prof.dr. P. van den Elsen; prof.dr. S. Gibbs; prof.dr. T. de Gruijl;
dr. J. den Haan; dr. I. van Hoogstraten; dr. E. Hooijberg;
prof.dr. R. Mebius; dr. M. Pegtel; dr. M. Ulrich; prof.dr. C. Verweij.

International Comparative Analyses of Health Care Systems

Vakcode	AM_470820 ()
Periode	Periode 3

Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. D.R. Essink
Examinator	dr. D.R. Essink
Docent(en)	prof. dr. J.E.W. Broerse, dr. D.R. Essink, dr. T.J. Schuitmaker-Warnaar
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	500

Doel vak

- To understand and recognize the different components of a health system and different models of health system organization using various frameworks for health system analysis
- To understand and analyze outcomes of health systems with respect to equity, fair financial contribution and health status
- To understand the complex adaptive nature of health systems and its constitution
- To understand different methods in analyzing and comparing health systems: health system performance assessment (benchmarking), case study analysis, cost effectiveness analysis
- To understand the underlying reasons for health system reform and to recognize different health care reform strategies;
- To understand cases study methodology regarding comparison of components of health systems
- To apply the acquired knowledge in the context of;
- To design, carry out and reflect on a (comparative) analysis of developing, transitional and developed countries, making use of the framework for comparative analysis;
- To be able to link the characteristics of policy recommendations, strategies on health system reform and public opinions on certain aspects of care to the specific determinants of the country/region at hand.
- To give a well structured and academically solid lecture on the comparison of countries;
- To write a clearly structured and academically solid paper on the comparative analysis you have carried out;

Inhoud vak

Given the fact that health systems worldwide are confronted with demographical and epidemiological changes, health systems are currently experiencing a period in which they have to re-assess their set-up, framework and goals. In this course you will obtain an overview of the complex nature of health systems and its different components, both with respect to conceptual components (service delivery, resource creation, stewardship, financing) and content components (primary care, mental health care, etc), and you will acquire skills to analyze and compare these components. In various lectures, both the quantitative aspects, and the critique there-upon, and the qualitative aspects of health system comparison is discussed. Furthermore, you will gain insight in the complexity and culturally determined nature of health system design and health system reform, through a series of lectures from VU-lecturers and experts from a variety of institutions such as the Royal Tropical Institute and the Nivel. Through two assignments, you learn and reflect on the topics that are discussed throughout the course. First, you will critically review a comparative analysis report on a specific aspect of

health care in Europe, and present this in a lecture. Second, you will set up your own comparative analysis between two selected countries on a specific health care theme. In this case, you are invited to look critically at your own analysis process. You will report on your findings by means of a report and via a poster presentation. In both assignments you will have regular feedback sessions with health researchers in small groups.

Onderwijsvorm

'Research methods for needs assessments' is a fulltime course of four weeks (6 ECTS). 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 22 hours
- assignment sessions 28 hours
- (project) self study 108 hours
- pass/fail test 2 hours

Attendance to the assignment sessions is compulsory

Toetsvorm

You are assessed on the basis of two comparative case study assignments. Both assignments need to be passed (higher than 5.5).

- Assignment 1: 40%
- Assignment 2: 60%

In addition a brief pass/fail test is given which needs a pass but is not graded, to check lecture attendance.

Literatuur

A selection of literature will be made on the basis of lectures and state of the art research. (selection of last years literature)

- Mills, A.J. and Ranson, M.K. (2006). The design of health systems. In Merson, M.H., Black, R.E. and Mills, A.J. (eds.). International public Health: diseases, programs, systems and policies. London: Jones and Bartlett.

Methods: Benchmarking

- WHO (2000). World Health report 2000: health systems: improving performance. Geneva: WHO.

- o Message from the director
- o Chapters 1 and 2
- o Statistical Annex

- M.M. Harbers, E.A. van der Wilk, P.G.N. Kramers, M.M.A.P. Kuunders, M. Verschuuren and Achterberg. (2010) Dare to compare: Benchmarking the Dutch health with the European community health indicators. RIVM

- o Chapters 1, 2, 3 and 10

- GP Westert, MJ, van den Berg, SLN Zwakhals, JD de Jong, H Verkleij (2010). The Dutch healthcare performance report. RIVM

- o Executive summary
- o Chapter 1
- o Chapter 6

Methods: case study

- Yin, R. K. (2009). Case Study Research: Design and Methods.

Fourth edition, Sage publications, London
o Chapters 1 and 2

Health systems

- George Shakarishvili, Rifat Atun, Peter Berman, William Hsiao, Craig Burgess, and Mary Ann Lansang (2010). Converging Health Systems Frameworks: Towards A Concepts-to-Actions Roadmap for Health Systems Strengthening in Low and Middle Income Countries. In Global Health Governance

- Hsiao (2003). What is a health system and why should we care

- Van Kemenade (2007). European Health Systems. Eslevier
o Chapter 15

- Plsek and Greenlagh, (2001). The challenge of complexity in healthcare. British Medical Journal,10, 323:625

- Building the field of health systems and policy research
o Framing the questions
o An Agenda for Action
o Social Science Matters

- Murray, C.J.L. and Frenk, J. (2008). Health metrics and evaluation: strengthening the science. Lancet, 371(9619), 1191-1199.

Aanbevolen voorkennis

It is recommended that students have knowledge on public policy in the context of healthcare.

Doelgroep

Compulsory course within the Master specialization International Public Health, optional course within the Master specialization Infectious Diseases (master programme Biomedical Sciences). In any other circumstances admission should be requested from the course coordinator.

Overige informatie

Guest lecturers:

Prof. dr. Joep Lange

dr. Rob Baltussen, health economics at (UMCG)

Dr. Michael van den Berg (RIVM)

Barend Gerretsen (KIT)

Prof. dr. Wienke Boerma (NIVEL)

Internship Biomedical Sciences- no spec.

Vakcode	AM_471158 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. R.J. van Belle-van den Berg
Examinator	dr. R.J. van Belle-van den Berg
Niveau	600

Doel vak

The internship is a compulsory part of the Master's programme and involves many different aspects, such as theoretical preparation, practical execution, literature survey, report writing, oral presentation, and participation in the scientific activities of a research department.

The internship should be related to the specialization undertaken.

At the end of the internship a scientific report of the work has to be written as well as an oral presentation given.

For more (detailed) information, please see the placement manual on Blackboard (ALW_BMW_9999_01: Master Programmes Biomedical Sciences and Biology)

Inhoud vak

The internship is a compulsory part of the Masters' programme in Biomedical Sciences.

The internship has to be preceded by a research proposal. During the internship, you collect your data and you do the final analysis. Finally you present your findings both orally and in a report.

Internships can be done at various locations, but should be part of an academical or research institute. Projects at academical or research institutes outside the Netherlands are also accepted, provided they are of sufficient academic quality and adequate on-site supervision is guaranteed. In all cases: take care that you will be working on research related to your specialization 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

Research project, under supervision of VU-staff.

Toetsvorm

Within six weeks after the start of the internship a Go/No Go evaluation is made by the VU supervisor. The aim of this interim evaluation is to decide whether the project and the student both have enough potential to continue (Go) or not (No Go). This evaluation is based on:

- Written material by the student, including a final research proposal and either the Introduction or Methods section of the article or both.
- Attitude of the student and execution of the project during the initial stage.

The final assessment of the internship is undertaken by the VU-supervisor and the second assessor.

In the final assessment, the VU supervisor assesses four different aspects of the internship:

- the attitude of the student
- the execution of the research
- the final report/article
- the oral presentation

The second assessor provides an assessment of the final report only.

The final report counts for 50% of the final grade, the oral presentation for 25% and the execution of the research also for 25%.

Only if marks for each item given by the VU-supervisor and the second assessor are 6 or higher and the attitude is a 'pass', the internship is regarded as sufficient. The final grade is calculated from the marks given by both assessors and, together with other administrative details, is summarized in the final assessment form, done by the master's coordinator.

Vereiste voorkennis

The student is enrolled in the Master's programme Biomedical Sciences of which the internship is part and has gained at least 18 ECTS from the programme. Depending on the specialization, additional requirements for admission have to be met (see the Placement Manual).

The second internship can only start after the first internship has been fully completed.

Doelgroep

Students from the MSc Biomedical Sciences

Intekenprocedure

Every research project has to be approved by the masters' coordinator in advance (on behalf of the examination board). The Placement Manual describes the process of completing the internship from the beginning (the admission) through the actual execution with its supervision to the final stage (assessment and grading) in consecutive order. The various stages of the process will be supported by forms which are supplied in the appendices or in links. Please see the placement manual on Blackboard (ALW_BMW_9999_01: Master Programmes Biomedical Sciences and Biology).

Overige informatie

The Placement Manual is based upon the 'Student Placement (Internship) and Research Project Regulations' of the Faculty of Earth and Life Sciences (FALW). Detailed information can be found in the Placement manual Biomedical Sciences on Blackboard (ALW_BMW_9999_01: Master Programmes Biomedical Sciences and Biology) and in the Academic and Examination Regulations (AER).

Duration of the internship is 5 months (30 EC) and may, under certain circumstances, be elongated to 36 EC (see AER and/or Placement manual).

It is not allowed for your literature thesis and internships to take place on the same or on a highly similar subject.

Internship Cardiovascular Diseases

Vakcode	AM_471136 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. R.J. van Belle-van den Berg
Examinator	dr. R.J. van Belle-van den Berg
Niveau	600

Doel vak

The internship is a compulsory part of the Master's programme and involves many different aspects, such as theoretical preparation, practical execution, literature survey, report writing, oral presentation, and participation in the scientific activities of a research department.

The internship should be related to Cardiovascular Diseases.

At the end of the internship a scientific report of the work has to be written as well as an oral presentation given.

For more (detailed) information, please see the placement manual on Blackboard (ALW_BMW_9999_01: Master Programmes Biomedical Sciences and Biology)

Inhoud vak

The internship is a compulsory part of the Masters' programme in Biomedical Sciences.

The internship has to be preceded by a research proposal. During the internship, you collect your data and you do the final analysis. Finally you present your findings both orally and in a report.

Internships can be done at various locations, but should be part of an academical or research institute. Projects at academical or research institutes outside the Netherlands are also accepted, provided they are of sufficient academic quality and adequate on-site supervision is guaranteed. In all cases: take care that you will be working on research related to your specialization 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

Research project, under supervision of VU-staff.

Toetsvorm

Within six weeks after the start of the internship a Go/No Go evaluation is made by the VU supervisor. The aim of this interim evaluation is to decide whether the project and the student both have enough potential to continue (Go) or not (No Go). This evaluation is based on:

- Written material by the student, including a final research proposal and either the Introduction or Methods section of the article or both.
- Attitude of the student and execution of the project during the initial stage.

The final assessment of the internship is undertaken by the VU-supervisor and the second assessor.

In the final assessment, the VU supervisor assesses four different aspects of the internship:

- the attitude of the student
- the execution of the research
- the final report/article
- the oral presentation

The second assessor provides an assessment of the final report only.

The final report counts for 50% of the final grade, the oral presentation for 25% and the execution of the research also for 25%.

Only if marks for each item given by the VU-supervisor and the second assessor are 6 or higher and the attitude is a 'pass', the internship is regarded as sufficient. The final grade is calculated from the marks given by both assessors and, together with other administrative details, is summarized in the final assessment form, done by the master's coordinator.

Vereiste voorkennis

The student is enrolled in the Master's programme Biomedical Sciences of which the internship is part.

The student has acquired 18EC of the following courses:

M_CCLINBIO09, 6EC, Clinical and Biophysical Aspects of Cardiovascular Diseases and Imaging

M_CPATHO09, 6EC, Pathophysiology of Heart and Circulation

M_CREMODE09, 6EC, Remodeling of the Circulatory System

M_CVASCFU09, 6EC, Vascular Function and Metabolic Diseases

The second internship can only start after the first internship has been fully completed.

Doelgroep

Students from the MSc Biomedical Sciences to specialize in Cardiovascular Diseases

Intekenprocedure

Every research project has to be approved by the masters' coordinator in advance (on behalf of the examination board). The Placement Manual describes the process of completing the internship from the beginning (the admission) through the actual execution with its supervision to the final stage (assessment and grading) in consecutive order. The various stages of the process will be supported by forms which are supplied in the appendices or in links. Please see the placement manual on Blackboard (ALW_BMW_9999_01: Master Programmes Biomedical Sciences and Biology).

Overige informatie

The Placement Manual is based upon the 'Student Placement (Internship) and Research Project Regulations' of the Faculty of Earth and Life Sciences (FALW). Detailed information can be found in the Placement manual Biomedical Sciences on Blackboard (ALW_BMW_9999_01: Master Programmes Biomedical Sciences and Biology) and in the Academic and Examination Regulations (AER).

Duration of the internship is 5 months (30 EC) and may, under certain circumstances, be elongated to 36 EC (see AER and/or Placement manual).

It is not allowed for your literature thesis and internships to take place on the same or on a highly similar subject.

Internship Communication Specialisation

Vakcode	AM_471145 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen

Coördinator	dr. J.F.H. Kupper
Examinator	dr. J.F.H. Kupper
Niveau	600

Doel vak

The internship is a compulsory part of the Master's programme. The aims of the internship are:

- Learn to independently apply and expand your practical science communication skills in one particular area of the field (writing, multi-media, facilitation, policy and strategy development, content design, etc.).
- Critical self-assessment and reflection on acquired science communication competencies in the field.
- Conduct scientific research independently: assess scientific information, design a research project, apply scientific methods, collect data, report and discuss findings.
- Present and discuss about internship and research outcomes.
- Learn to cooperate with researchers and practitioners of various disciplines.
- Gain an impression of a potential future field of career.

Inhoud vak

When you are enrolled in the VU Science Communication specialization or the UvA Major Science Communication you need to conduct one internship (30 ECTS, 5 months). MPA students that choose the Science Communication specialization also need to do at least one internship (30 ECTS, 5months) in the Science Communication field. The internship has two possible formats: the full Research Internship and the Reflective Practice Placement (RPP). The complete and up-to-date information about the internship can be found in the SC internship guide line on blackboard (science communication community).

Onderwijsvorm

Work placement, under supervision of VU-staff.

Toetsvorm

Within six weeks after the start of the internship a Go/No Go evaluation is made by the VU supervisor. The aim of this interim evaluation is to decide whether the project and the student both have enough potential to continue (Go) or not (No Go). This evaluation is based on:

- Written material by the student, including a final research proposal and either the Introduction or Methods section of the article or both.
- Attitude of the student and execution of the project during the initial stage.

The final assessment of the internship is undertaken by the VU-supervisor and the second assessor.

In the final assessment, the VU supervisor assesses four different aspects of the internship:

- the attitude of the student
- the execution of the research
- the final report/article
- the oral presentation

The second assessor provides an assessment of the final report only.

The final report counts for 50% of the final grade, the oral presentation for 25% and the execution of the research also for 25%.

Only if marks for each item given by the VU-supervisor and the second assessor are 6 or higher and the attitude is a 'pass', the internship is regarded as sufficient. The final grade is calculated from the marks given by both assessors and, together with other administrative details, is summarized in the final assessment form, done by the master's coordinator.

Vereiste voorkennis

The student is enrolled in the Master's programme Biomedical Sciences of which the internship is part.

The student has passed the following courses:

AM_470582, Qualitative and Quantitative Research Methods

AM_470587, Science and Communication

And the student has acquired 6EC of the following courses:

AM_470572, 6EC, Communication, Organization and Management

AM_1002, 6EC, Science in Dialogue

AM_471014, 6EC, Science Journalism

AM_470590, 6EC, Science Museology

The second internship can only start after the first internship has been fully completed.

Doelgroep

Students from the MSc Biomedical Sciences to specialize in Communication

Intekenprocedure

The placement coordinator and the VU-supervisor approve the research proposal, after which the application has to be approved by the masters' coordinator in advance (on behalf of the examination board). The Placement Manual describes the process of completing the internship from the beginning (the admission) through the actual execution with its supervision to the final stage (assessment and grading) in consecutive order. The various stages of the process will be supported by forms which are supplied in the appendices or in links. Please see the placement manual on Blackboard (ALW_BMW_9999_01: Master Programmes Biomedical Sciences and Biology).

Overige informatie

The Placement Manual is based upon the 'Student Placement (Internship) and Research Project Regulations' of the Faculty of Earth and Life Sciences (FALW). Detailed information can be found in the Placement manual Biomedical Sciences on Blackboard (ALW_BMW_9999_01: Master Programmes Biomedical Sciences and Biology) and in the Academic and Examination Regulations (AER).

Internship Educational Specialisation

Vakcode	AM_471143 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. R.J. van Belle-van den Berg
Examinator	dr. R.J. van Belle-van den Berg
Niveau	600

Internship Immunology

Vakcode	AM_471137 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. R.J. van Belle-van den Berg
Examinator	dr. R.J. van Belle-van den Berg
Niveau	600

Doel vak

The internship is a compulsory part of the Master's programme and involves many different aspects, such as theoretical preparation, practical execution, literature survey, report writing, oral presentation, and participation in the scientific activities of a research department.

The internship should be related to Immunology.

At the end of the internship a scientific report of the work has to be written as well as an oral presentation given.

For more (detailed) information, please see the placement manual on Blackboard (ALW_BMW_9999_01: Master Programmes Biomedical Sciences and Biology)

Inhoud vak

The internship is a compulsory part of the Masters' programme in Biomedical Sciences.

The internship has to be preceded by a research proposal. During the internship, you collect your data and you do the final analysis. Finally you present your findings both orally and in a report.

Internships can be done at various locations, but should be part of an academical or research institute. Projects at academical or research institutes outside the Netherlands are also accepted, provided they are of sufficient academic quality and adequate on-site supervision is guaranteed. In all cases: take care that you will be working on research related to your specialization 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

Research project, under supervision of VU-staff.

Toetsvorm

Within six weeks after the start of the internship a Go/No Go evaluation is made by the VU supervisor. The aim of this interim evaluation is to decide whether the project and the student both have enough potential to continue (Go) or not (No Go). This evaluation is based on:

- Written material by the student, including a final research proposal and either the Introduction or Methods section of the article or both.
- Attitude of the student and execution of the project during the

initial stage.

The final assessment of the internship is undertaken by the VU-supervisor and the second assessor.

In the final assessment, the VU supervisor assesses four different aspects of the internship:

- the attitude of the student
- the execution of the research
- the final report/article
- the oral presentation

The second assessor provides an assessment of the final report only.

The final report counts for 50% of the final grade, the oral presentation for 25% and the execution of the research also for 25%. Only if marks for each item given by the VU-supervisor and the second assessor are 6 or higher and the attitude is a 'pass', the internship is regarded as sufficient. The final grade is calculated from the marks given by both assessors and, together with other administrative details, is summarized in the final assessment form, done by the master's coordinator.

Vereiste voorkennis

The student is enrolled in the Master's programme Biomedical Sciences of which the internship is part.

The student attended the course:

AM_470656, Advanced Molecular Immunology and Cell Biology

And the student has acquired 18EC of the following courses:

AM_470656, 6EC, Advanced Molecular Immunology and Cell Biology

AM_1031, 6EC, Immunity and Disease

AM_470655, 6EC, Clinical Immunology

AM_470657, 6EC, Molecular Infection Biology

The second internship can only start after the first internship has been fully completed.

Doelgroep

Students from the MSc Biomedical Sciences to specialize in Immunology

Intekenprocedure

Every research project has to be approved by the masters' coordinator in advance (on behalf of the examination board). The Placement Manual describes the process of completing the internship from the beginning (the admission) through the actual execution with its supervision to the final stage (assessment and grading) in consecutive order. The various stages of the process will be supported by forms which are supplied in the appendices or in links. Please see the placement manual on Blackboard (ALW_BMW_9999_01: Master Programmes Biomedical Sciences and Biology).

Overige informatie

The Placement Manual is based upon the 'Student Placement (Internship) and Research Project Regulations' of the Faculty of Earth and Life Sciences (FALW). Detailed information can be found in the Placement manual Biomedical Sciences on Blackboard (ALW_BMW_9999_01: Master Programmes Biomedical Sciences and Biology) and in the Academic and Examination Regulations (AER).

Duration of the internship is 5 months (30 EC) and may, under certain circumstances, be elongated to 36 EC (see AER and/or Placement manual).

It is not allowed for your literature thesis and internships to take place on the same or on a highly similar subject.

Internship Infectious Diseases

Vakcode	AM_471138 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. R.J. van Belle-van den Berg
Examinator	dr. R.J. van Belle-van den Berg
Niveau	600

Doel vak

The internship is a compulsory part of the Master's programme and involves many different aspects, such as theoretical preparation, practical execution, literature survey, report writing, oral presentation, and participation in the scientific activities of a research department.

The internship should be related to Infectious Diseases.

At the end of the internship a scientific report of the work has to be written as well as an oral presentation given.

For more (detailed) information, please see the placement manual on Blackboard (ALW_BMW_9999_01: Master Programmes Biomedical Sciences and Biology)

Inhoud vak

The internship is a compulsory part of the Masters' programme in Biomedical Sciences.

The internship has to be preceded by a research proposal. During the internship, you collect your data and you do the final analysis. Finally you present your findings both orally and in a report.

Internships can be done at various locations, but should be part of an academical or research institute. Projects at academical or research institutes outside the Netherlands are also accepted, provided they are of sufficient academic quality and adequate on-site supervision is guaranteed. In all cases: take care that you will be working on research related to your specialization 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

Research project, under supervision of VU-staff.

Toetsvorm

Within six weeks after the start of the internship a Go/No Go evaluation is made by the VU supervisor. The aim of this interim evaluation is to decide whether the project and the student both have enough potential to continue (Go) or not (No Go). This evaluation is based on:

- Written material by the student, including a final research proposal and either the Introduction or Methods section of the article or both.
- Attitude of the student and execution of the project during the initial stage.

The final assessment of the internship is undertaken by the VU-supervisor and the second assessor.

In the final assessment, the VU supervisor assesses four different aspects of the internship:

- the attitude of the student
- the execution of the research
- the final report/article
- the oral presentation

The second assessor provides an assessment of the final report only.

The final report counts for 50% of the final grade, the oral presentation for 25% and the execution of the research also for 25%. Only if marks for each item given by the VU-supervisor and the second assessor are 6 or higher and the attitude is a 'pass', the internship is regarded as sufficient. The final grade is calculated from the marks given by both assessors and, together with other administrative details, is summarized in the final assessment form, done by the master's coordinator.

Vereiste voorkennis

The student is enrolled in the Master's programme Biomedical Sciences of which the internship is part.

The student attended the courses AM_470656, Advanced Molecular Immunology and Cell Biology and AM_470657, Molecular Infection Biology and the student has acquired 18EC of the following courses:

AM_470656, 6EC, Advanced Molecular Immunology and Cell Biology
 AM_470127, 6EC, Containment Strategies of Infectious Diseases in Global Context
 AM_470052, 6EC, Parasitology
 AM_470094, 6EC, Health Geography
 AM_470657, 6EC, Molecular Infection Biology
 M_OVIRONC03, 3EC, Viral Oncogenesis

The second internship can only start after the first internship has been fully completed.

Doelgroep

Students from the MSc Biomedical Sciences to specialize in Infectious Diseases

Intekenprocedure

Every research project has to be approved by the masters' coordinator in advance (on behalf of the examination board). The Placement Manual describes the process of completing the internship from the beginning (the admission) through the actual execution with its supervision to the final stage (assessment and grading) in consecutive order. The various stages of the process will be supported by forms which are supplied in the appendices or in links. Please see the placement manual on Blackboard (ALW_BMW_9999_01: Master Programmes Biomedical Sciences and Biology).

Overige informatie

The Placement Manual is based upon the 'Student Placement (Internship) and Research Project Regulations' of the Faculty of Earth and Life

Sciences (FALW). Detailed information can be found in the Placement manual Biomedical Sciences on Blackboard (ALW_BMW_9999_01: Master Programmes Biomedical Sciences and Biology) and in the Academic and Examination Regulations (AER).

Duration of the internship is 5 months (30 EC) and may, under certain circumstances, be elongated to 36 EC (see AER and/or Placement manual).

It is not allowed for your literature thesis and internships to take place on the same or on a highly similar subject.

Internship International Public Health

Vakcode	AM_471139 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. B.J. Regeer
Examinator	dr. B.J. Regeer
Niveau	600

Doel vak

The internship is a compulsory part of the Master's programme and involves many different aspects, such as theoretical preparation, practical execution, literature survey, report writing, oral presentation, and participation in the scientific activities of a research department.

The internship should be related to International Public Health.

At the end of the internship a scientific report of the work has to be written as well as an oral presentation given.

For more (detailed) information, please see the placement manual on Blackboard (ALW_BMW_9999_01: Master Programmes Biomedical Sciences and Biology)

Inhoud vak

The internship is a compulsory part of the Masters' programme in Biomedical Sciences.

The internship has to be preceded by a research proposal. During the internship, you write an extended research design, collect your data and you do the final analysis. Finally you present your findings both orally and in a report.

Internships can be done at various locations, but should be part of an academical or research institute. Projects at academical or research institutes outside the Netherlands are also accepted, provided they are of sufficient academic quality and adequate on-site supervision is guaranteed. In all cases: take care that you will be working on research related to your specialization 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

Research project, under supervision of VU-staff.

Toetsvorm

Within six weeks after the start of the internship a Go/No Go evaluation is made by the VU supervisor. The aim of this interim evaluation is to decide whether the project and the student both have enough potential to continue (Go) or not (No Go). This evaluation is based on:

- Written material by the student, including a final research proposal and either the Introduction or Methods section of the article or both.
- Attitude of the student and execution of the project during the initial stage.

The final assessment of the internship is undertaken by the VU-supervisor and the second assessor.

In the final assessment, the VU supervisor assesses four different aspects of the internship:

- the attitude of the student
- the execution of the research
- the final report/article
- the oral presentation

The second assessor provides an assessment of the final report only.

The final report counts for 50% of the final grade, the oral presentation for 25% and the execution of the research also for 25%. Only if marks for each item given by the VU-supervisor and the second assessor are 6 or higher and the attitude is a 'pass', the internship is regarded as sufficient. The final grade is calculated from the marks given by both assessors and, together with other administrative details, is summarized in the final assessment form, done by the master's coordinator.

Vereiste voorkennis

The student is enrolled in the Master's programme Biomedical Sciences of which the internship is part.

The student has passed the following courses:

AM_470817, 6EC, Research Methods for Need Assessments

AM_470127, 6EC, Containment Strategies of Infectious Diseases in Global Context

AM_470819, 6EC, Policy, Management and Organization in International Public Health

The second internship can only start after the first internship has been fully completed.

Doelgroep

Students from the MSc Biomedical Sciences to specialize in IPH

Intekenprocedure

The research proposal is approved by the placement coordinator and the VU-supervisor, after which the application has to be approved by the masters' coordinator in advance (on behalf of the examination board). The Placement Manual describes the process of completing the internship from the beginning (the admission) through the actual execution with its supervision to the final stage (assessment and grading) in consecutive order. The various stages of the process will be supported by forms which are supplied in the appendices or in links. Please see the

placement manual on Blackboard (ALW_BMW_9999_01: Master Programmes Biomedical Sciences and Biology).

Overige informatie

The Placement Manual is based upon the 'Student Placement (Internship) and Research Project Regulations' of the Faculty of Earth and Life Sciences (FALW). Detailed information can be found in the Placement manual Biomedical Sciences on Blackboard (ALW_BMW_9999_01: Master Programmes Biomedical Sciences and Biology) and in the Academic and Examination Regulations (AER).

Duration of the internship is 5 months (30 EC) and may, under certain circumstances, be elongated to 36 EC (see AER and/or Placement manual).

It is not allowed for your literature thesis and internships to take place on the same or on a highly similar subject.

Internship Med. and Behavioural Genomics

Vakcode	AM_471142 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. R.J. van Belle-van den Berg
Examinator	dr. R.J. van Belle-van den Berg
Niveau	600

Doel vak

The internship is a compulsory part of the Master's programme and involves many different aspects, such as theoretical preparation, practical execution, literature survey, report writing, oral presentation, and participation in the scientific activities of a research department.

The internship should be related to Medical and Behavioural Genomics.

At the end of the internship a scientific report of the work has to be written as well as an oral presentation given.

For more (detailed) information, please see the placement manual on Blackboard (ALW_BMW_9999_01: Master Programmes Biomedical Sciences and Biology)

Inhoud vak

The internship is a compulsory part of the Masters' programme in Biomedical Sciences.

The internship has to be preceded by a research proposal. During the internship, you collect your data and you do the final analysis. Finally you present your findings both orally and in a report.

Internships can be done at various locations, but should be part of an academical or research institute. Projects at academical or research institutes outside the Netherlands are also accepted, provided they are of sufficient academic quality and adequate on-site supervision is

guaranteed. In all cases: take care that you will be working on research related to your specialization 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

Research project, under supervision of VU-staff.

Toetsvorm

Within six weeks after the start of the internship a Go/No Go evaluation is made by the VU supervisor. The aim of this interim evaluation is to decide whether the project and the student both have enough potential to continue (Go) or not (No Go). This evaluation is based on:

- Written material by the student, including a final research proposal and either the Introduction or Methods section of the article or both.
- Attitude of the student and execution of the project during the initial stage.

The final assessment of the internship is undertaken by the VU-supervisor and the second assessor.

In the final assessment, the VU supervisor assesses four different aspects of the internship:

- the attitude of the student
- the execution of the research
- the final report/article
- the oral presentation

The second assessor provides an assessment of the final report only.

The final report counts for 50% of the final grade, the oral presentation for 25% and the execution of the research also for 25%. Only if marks for each item given by the VU-supervisor and the second assessor are 6 or higher and the attitude is a 'pass', the internship is regarded as sufficient. The final grade is calculated from the marks given by both assessors and, together with other administrative details, is summarized in the final assessment form, done by the master's coordinator.

Vereiste voorkennis

The student is enrolled in the Master's programme Biomedical Sciences of which the internship is part.

The student has acquired 18EC of the following courses:

- AM_470733, 6EC, Complex Trait Genetics
- AM_1008, 6EC, Genomic Data Analysis
- AM_1040, 6EC, Statistical Genetics for Gene Finding

The second internship can only start after the first internship has been fully completed.

Doelgroep

Students from the MSc Biomedical Sciences to specialize in Medical and Behavioural Genomics.

Intekenprocedure

Every research project has to be approved by the masters' coordinator in advance (on behalf of the examination board). The Placement Manual describes the process of completing the internship from the beginning (the admission) through the actual execution with its supervision to the final stage (assessment and grading) in consecutive order. The various stages of the process will be supported by forms which are supplied in

the appendices or in links. Please see the placement manual on Blackboard (ALW_BMW_9999_01: Master Programmes Biomedical Sciences and Biology).

Overige informatie

The Placement Manual is based upon the 'Student Placement (Internship) and Research Project Regulations' of the Faculty of Earth and Life Sciences (FALW). Detailed information can be found in the Placement manual Biomedical Sciences on Blackboard (ALW_BMW_9999_01: Master Programmes Biomedical Sciences and Biology) and in the Academic and Examination Regulations (AER).

Duration of the internship is 5 months (30 EC) and may, under certain circumstances, be elongated to 36 EC (see AER and/or Placement manual).

It is not allowed for your literature thesis and internships to take place on the same or on a highly similar subject.

Internship Science in Society (BMED)

Vakcode	AM_1133 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. T.J. Schuitmaker-Warnaar
Examinator	dr. T.J. Schuitmaker-Warnaar

Doel vak

The aim of the internship as part of the Major Science in Society (societal specialisation) is to apply the competences acquired during the previous courses in a research project in order to ground the knowledge, attitudes and skills of interdisciplinary research. More specifically, the aims of the internships are:

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

Inhoud vak

The internship is a compulsory part of the one year specialisation as part of the regular master. The duration of the internship is 5 months (30 EC). An internship placement must provide the student with the opportunity to learn how to conduct research under supervision. The onsite supervisor of the internship is linked to an academic or research

institution.

Internships can be done at various locations such as the Ministry of Health, Welfare and Sports, the Public Health Inspectorate, the Health Council, medical organizations such as the municipality health service (GGD), consultancies, the (pharmaceutical) industry and several research institutes, such as universities or e.g. the National Institute for Public Health and the Environment (RIVM).

An internship typically has three phases

- In the first phase, you write your research proposal consisting of an introduction, background, theoretical/conceptual framework, research questions and your research methodology.
- In the second phase, you collect your (qualitative and/or quantitative) data.
- In the third phase, you do your final analysis and present your findings both orally and in a report. The presentation seminar is a compulsory part of this third phase.

Onderwijsvorm

The internship is a compulsory part of the one year specialisation as part of the regular master. The duration of the internship is 5 months (30 EC). An internship placement must provide the student with the opportunity to learn how to conduct research under supervision. The onsite supervisor of the internship is linked to an academic or research institution.

Internships can be done at various locations such as the Ministry of Health, Welfare and Sports, the Public Health Inspectorate, the Health Council, medical organizations such as the municipality health service (GGD), consultancies, the (pharmaceutical) industry and several research institutes, such as universities or e.g. the National Institute for Public Health and the Environment (RIVM).

An internship typically has three phases

- In the first phase, you write your research proposal consisting of an introduction, background, theoretical/conceptual framework, research questions and your research methodology.
- In the second phase, you collect your (qualitative and/or quantitative) data.
- In the third phase, you do your final analysis and present your findings both orally and in a report. The presentation seminar is a compulsory part of this third phase.

Toetsvorm

Report (55%), Oral presentation (15%), Execution (30%) and Attitude (Pass/fail)

Within six weeks after the start of the master internship, an interim evaluation will take place to assess whether there is a reasonable chance of the placement being brought to a successful completion.

The internship is supervised and assessed by two lecturers. Both lecturers are members of the academic staff at VU University Amsterdam. The onsite supervision can be carried out by a trainee research assistant (AIO), postdoc or researcher.

Vereiste voorkennis

To ensure that students do have enough background knowledge, it is required that you have passed the three compulsory courses: 'Qualitative and Qualitative Research Methods', 'Communication Organization and Management', and 'Analysis of Governmental Policy' (grade at least 6).

Doelgroep

Students Major Science in Society (societal specialisation)

Intekenprocedure

Internships can only start when the draft research proposal and application and agreement form is approved and signed by the specialization coordinator.

Overige informatie

The placement may be extended by 6 EC, subject to conditions that can be found in the FALW document "Student placement (internship) and literature regulations". The student must send a request for extension to the Examination Board.

Information on internships is made available on Blackboard.

Internship Societal Specialisation

Vakcode	AM_471144 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. R.J. van Belle-van den Berg
Examinator	dr. R.J. van Belle-van den Berg
Niveau	600

Literature thesis Biomedical Sciences

Vakcode	AM_471135 ()
Periode	Ac. Jaar (september)
Credits	9.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. R.J. van Belle-van den Berg
Examinator	dr. R.J. van Belle-van den Berg

Doel vak

The 9 EC literature thesis is a compulsory part of the master Biomedical Sciences, with the aim to reflect on scientific literature. In a total of 6 weeks (full time), the student specializes in a certain topic by gathering and analyzing (recent) scientific articles and other literature that can be included in the literature research. The student can decide the topic of the thesis.

The topic of the thesis needs to match one of the student's research specialization(s).

Onderwijsvorm

Literature thesis, under supervision of VU-staff.

Toetsvorm

The assessment of the literature thesis is undertaken by the VU-supervisor and an optional second supervisor.

The literature thesis is assessed on the following aspects:

- execution of the thesis
- final report/review
- oral presentation

Vereiste voorkennis

We advise you to have finished at least all the specific courses, and preferably also the internship, of the research specialization of which this thesis is part.

Doelgroep

Students from the MSc Biomedical Sciences

Intekenprocedure

Every literature thesis has to be approved by the masters' coordinator in advance (on behalf of the examination board). On Blackboard you can find guidelines for the literature thesis that describe the process of completing the literature thesis from the beginning (the admission) through the actual execution with its supervision to the final stage (assessment and grading) in consecutive order. The various stages of the process will be supported by forms which can also be found on Blackboard. Please see the guidelines on Blackboard (ALW_BMW_9999_01: Master Programmes Biomedical Sciences and Biology).

Overige informatie

Detailed information can be found in the guidelines on Blackboard (ALW_BMW_9999_01: Master Programmes Biomedical Sciences and Biology) and in the Academic and Examination Regulations (AER).

It is not allowed for your literature thesis and internships to take place on the same or on a highly similar subject.

Molecular Infection Biology

Vakcode	AM_470657 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. W. Bitter
Examinator	prof. dr. W. Bitter
Docent(en)	prof. dr. W. Bitter
Lesmethode(n)	Hoorcollege, Practicum
Niveau	600

Doel vak

To understand how the interaction of a pathogen with its host is studied (in vitro studies, use of alternative in vivo models, different approaches of mutant screening)

To understand the variation within microbial pathogens and the effect this variation has on host adaptation.

To understand what virulence factors are and how they are regulated by the pathogen.

To apply the acquired knowledge to interpret scientific literature and scientific hypotheses regarding pathogen-host interactions.

Inhoud vak

The recent explosion in genomic data of both microbes and eukaryotic hosts and the continuous progress in molecular biology allows a detailed analysis of the molecular interactions between a pathogen and its host. This knowledge is necessary because we are continuously exposed to new emerging pathogens and the resurgence of old plagues and need new vaccines and anti-microbial compounds. However, which technique should and could be used for a specific problem and how to interpret conflicting outcomes using different experimental strategies? This course aims to provide a thorough understanding and practical experience of molecular biology as it applies to infectious agents. The course covers the application of molecular biology to studying the basic biology of pathogenic bacteria and viruses (their virulence factors, taxonomy and genetic typing) and the genetic susceptibility of the host to infection. It aims to equip students with the specialised knowledge and skills necessary to assess primary literature on medical microbiology.

Onderwijsvorm

The course has three different parts: lectures, practicum and workshop. In the latter part students will discuss with each other opposing views on controversial topics in medical microbiology that recently appeared in the literature.

contact hours:

lectures: 18

Literature Workshop: 17

Practicum: 30-40

Toetsvorm

written exam (50% of final mark and should be minimally 5,5)

literature discussion (workshop, 30% of final mark)

practicum (20% of final mark)

Literatuur

Reader will be available one week before the start of the course.

Vereiste voorkennis

Bachelor's course 'Infectieziekten' and 'Immunologie' or an equivalent course in Microbiology and Molecular Biology with practical skills of handling microorganisms safely

Doelgroep

Students with a keen interest to study the interaction between a pathogen and its host, from a practical as well as a theoretical point of view

Overige informatie

Guest lectures:

Dr. Peter van der Ley, RIVM Bilthoven, molecular techniques used for vaccine development

Dr. Lia van der Hoek, AMC Amsterdam, identification of novel viral pathogens

Parasitology

Vakcode	AM_470052 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. M. Campos Ponce
Examinator	dr. M. Campos Ponce
Docent(en)	dr. M. Campos Ponce, dr. C.B. Polman, dr. M.R. van Dijk
Lesmethode(n)	Hoorcollege, Computerpracticum, Practicum, Werkgroep
Niveau	400

Doel vak

This course aims to provide students with a wide knowledge and understanding of Medical Parasitology.

At the end of the course students: will have learned the principles of medical parasitology and will be able to:

- *apply these principles to different parasite groups
- *describe parasite life cycles
- *identify the role of the host and parasite on the outcome of an infection and describe underlying molecular host-parasite interactions
- *describe (and understand) the effect of parasite infection on other infectious diseases as well as on non-communicable diseases
- *describe the advantages and disadvantages of diagnostic techniques as discussed in literature.
- *describe the principles for treatment and prevention programmes
- *describe the principles for vaccination research
- *debate on important controversies within parasitological themes

Inhoud vak

The course will cover all aspects of medical important parasites: life cycles, virulence factors, (immunological) interaction between parasites and their host(s), diagnosis, epidemiology, control and elimination.

Onderwijsvorm

Lectures will be followed by discussion groups or in- class assignments. In discussion groups students will be expected to demonstrate an in-depth understanding of medically important parasites.

During the first two weeks students will have (interactive) guest lectures covering all aspects of medical parasitology. During these first two weeks they will also have to present selected articles during two sessions and they will have the opportunity to observe and identify parasites during the parasite demonstration.

The examination will take place in the third week.

In the final week students will present a selected parasite during an elevator pitch. At the end of this week students will have to actively participate in a debate on a selected parasitological topic.

Total contact hours:
Lectures: 32 hours
Workgroups: 14 hours
Parasite demonstration: 4 hours

Toetsvorm

The final grade will be determined on the basis of a written examination. Bonus points can be earned on the basis of oral presentations (regular presentations as well as their performance during the elevator pitch and the debate).

Literatuur

Reader

Vereiste voorkennis

Immunology, Infectious disease

Aanbevolen voorkennis

Basic cell biology and basic immunology

Doelgroep

Obligatory course within the MSc Infectious disease specialisation Health Sciences; Optional course within the MSc programmes of Biomedical sciences.

Overige informatie

Several guest lecturers will be invited to give lectures

Parasitology

Vakcode	AM_1055 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. M. Campos Ponce
Examinator	dr. M. Campos Ponce
Docent(en)	dr. M. Campos Ponce, dr. C.B. Polman, dr. M.R. van Dijk
Lesmethode(n)	Hoorcollege, Practicum, Werkgroep, Computerpracticum
Niveau	400

Pathophysiology of Heart and Circulation

Vakcode	M_CPATHO09 (3120014)
Periode	Periode 1
Credits	6.0
Voertaal	Engels

Faculteit	VUmc
Coördinator	dr. W.S. Simonides
Examinator	dr. W.S. Simonides
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	400

Doel vak

To gain knowledge of the most important cardiovascular concepts, theories, techniques, research questions and journals.

Inhoud vak

This course focuses on the fundamental aspects of normal cardiac function, cardiac dysfunction and the development of heart failure. Basic information will be presented regarding anatomy and physiology of the heart and the circulation in health and disease.

The following topics will be addressed:

- cardiac contractile function
- circulation, blood pressure and fluid dynamics
- cardiac signal transduction and gene regulation
- cardiac remodelling and heart failure
- cardiomyopathies
- mitochondrial function in heart failure
- electrophysiology and arrhythmia
- endothelial heterogeneity
- vascular tone
- arteriosclerosis
- angiogenesis

Onderwijsvorm

Lectures, working groups, assignments

Literatuur

Book: Cardiology, Crawford-Di Marco-Paulus 3rd Ed.(recommended) syllabus including relevant articles.

Book: Pathophysiology of heart disease (Ed L.S. Lilly); syllabus including relevant articles.

Intekenprocedure

Students can register for this course and examinations via vunet.vu.nl (under My study, register for courses and exams). The general VU registration rules apply. Information on registration deadlines can be found in VUnet. Please note that the general VU rules are strict, both for booking of the classes and (resit-)exams.

Policy, Management and Organisation in International Public Health

Vakcode	AM_470819 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. J.E.W. Broerse
Examinator	prof. dr. J.E.W. Broerse

Docent(en)	prof. dr. J.E.W. Broerse, M.O. Kok
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	500

Doel vak

To develop a detailed understanding of the health policy process and its outcomes both at national and international level
 To acquire insight into the different theoretical concepts on policy design in the field of public health
 To understand how policy decisions are translated into programs and projects, and subsequently implemented
 To get acquainted with different management practices in health programs
 To gain insight into change management
 To get acquainted with and acquire skills in international diplomacy, resolution writing, negotiation and the procedures of the United Nations

Inhoud vak

This course contains two parts that will run parallel throughout the course: a theoretical part and a practical, diplomacy, part. In the theoretical part you study different theoretical concepts of policy science in international public health. You study core concepts of public administration in relation to IPH such as power relations, securing public interest, public versus private sector, managing change and the network society. Questions are addressed such as: In what way does the political structure of a country influence health policies; Why do certain topics get on the policy agenda while other topics never make it; Why do policy makers and politicians regularly seem to ignore scientific insights; To what extent do international organisations (such as the World Bank and the World Health Organisation) influence national policies? In the diplomacy part you develop basic diplomatic skills by practicing them in 4 training sessions and a final 1.5 day World Health Organization simulation under Model United Nations rules of procedure (WHO MUN). Model United Nations (informally abbreviated as Model UN or MUN) is an academic simulation of the United Nations that aims to educate you about civics, effective communication, globalization and multilateral diplomacy. In Model UN, you take on roles as foreign diplomats and participate in a simulated session of the WHO.

Onderwijsvorm

Lectures (29 hours), training workshops (14 hours) and simulation (12 hours), self study (102,5 hours), and examination (2.5 hours)

Toetsvorm

Individual exam (70%) and diplomacy assignment (30%). Both grades need to be at least 5.5 to pass the course.

Literatuur

"Making Health Policy", Kent Buse, Nicholas Mays & Gill Walt, 2005, Open University Press, ISBN 0-335-21839-3

"The Wisdom of Whores", Elizabeth Pisani, 2008, Granta Publications, ISBN978-1-84708-076-9

Other reading materials via Blackboard

Doelgroep

Compulsory course within the Master specialization International Public Health; optional course for students in other specializations of the Masters Health Sciences and Biomedical Sciences.

Overige informatie

Attendance of training workshops and simulation is compulsory.
For further information and application, please contact Anna van Luijn (a.van.luijn@vu.nl)

Policy, Politics and Participation

Vakcode	AM_470589 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	C.A.C.M. Pittens MSc
Examinator	C.A.C.M. Pittens MSc
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

Total course 6 EC = 160 hours
 lectures 14 hours
 training workshops 4 hours,
 project assignment 102 hours
 focus group execution 3 hours
 Self study 33 hours
 final presentations project results: 4 hours

Toetsvorm

The course does not have an oral or written exam. You will be assessed on the basis of the group assignment, a group presentation and on your individual performance during the course (in the work groups, your facilitation skills in the 'real' focus groups). For all parts a pass grade (> 5.5) needs to be obtained in order to receive a final mark.

Your final mark will be based on: the group report (40%): oral presentation per group(40%): individual performance (20%).

Literatuur

To be announced on Blackboard

Vereiste voorkennis

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

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.

Intekenprocedure

Registration deadline by VUnet is 4 weeks before the start of the course.

Overige informatie

As the project depends on team work, attendance is compulsory.

Psychophysiology

Vakcode	AM_470736 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. J.C.N. de Geus
Examinator	prof. dr. J.C.N. de Geus
Docent(en)	prof. dr. J.C.N. de Geus
Lesmethode(n)	Werkgroep, Practicum, Hoorcollege
Niveau	400

Doel vak

1) Insight in the link between emotional state and peripheral nervous system activity and the most recent experimental approaches and research designs in the field of autonomic and cardiovascular psychophysiology.

2) Practical skills in the measurement of autonomic nervous system and cardiovascular stress-reactivity.

Inhoud vak

In plenary lectures we will outline the organisation of the autonomic nervous system and the cardiovascular system and how their activity is reflected in peripheral physiological signals. The lectures are interspersed with a series of practicals, where the students apply a broad arsenal of instruments and techniques (ElectroCardioGram, ImpedanceCardioGram, Skin-conductance, Respiration, Finger Blood Pressure, Hormones) to record these signals and to extract parameters that can be used to index psychological processes (e.g. mental load, emotion and stress). This will be done in a standardized laboratory setting using the Biopac system as well as in naturalistic open-field settings using the Vrije Universiteit Ambulatory Monitoring System (VU-AMS). Amongst others, students will measure (on each other): skin-conductance responses to emotion, cardiorespiratory coupling, baroreflex regulation, and sympathetic and parasympathetic reactivity to mental and physical stress. The main principles and strategies for data analysis will be covered in the lectures and applied in the practicals to the self-recorded data-sets.

Onderwijsvorm

In plenary lectures we will outline the organisation of the autonomic nervous system and the cardiovascular system and how their activity is reflected in peripheral physiological signals. The lectures are interspersed with a series of practicals, where the students apply a broad arsenal of instruments and techniques (ElectroCardioGram, ImpedanceCardioGram, Skin-conductance, Respiration, Finger Blood Pressure, Accelerometry) to record these signals and to extract parameters that can be used to index psychological processes (e.g. mental load, emotion and stress). This will be done in a standardized laboratory setting using the Biopac system as well as in naturalistic open-field settings using the Vrije Universiteit Ambulatory Monitoring System (VU-AMS). Amongst others, students will measure (on each other): skin-conductance responses to emotion, cardiorespiratory coupling, baroreflex regulation, and sympathetic and parasympathetic reactivity to mental and physical stress. The main principles and strategies for data analysis will be covered in the lectures and applied in the practicals to the self-recorded data-sets.

Number of contact hours:

Lectures: 20h

practicals & practical preparation: 70h

Examination: 2h

self-study: 70h

Toetsvorm

Written examination (50% of grade) and independent performance of a short experiment (20%) and analysis and presentation of the data collected (30%).

Literatuur

1) Psychophysiology reader with selected open access papers (published on BlackBoard, end of August)

AND

2a) Vander, A., Sherman, J. & Luciano, D. Human physiology, the

mechanisms of body function. Boston: WCB-McGraw-Hill: blz 373-463 (Circulation), blz 463-504(Respiration).

OR

2b) Stanfield J, Principles of Human Physiology (4th Ed). Pearson Education Inc: chapters 13,14 (Circulation), and 16 (Respiration)

AND

3) 7 short practical manuals

Vereiste voorkennis

If followed as part of the Master Biomedical Sciences must have completed the 1st year.

Aanbevolen voorkennis

General knowledge of cardiovascular physiology, SPSS usage, and biomedical experimentation.

Doelgroep

Master of Biomedical Sciences, Master of Neuroscience or comparable Master programs.

Intekenprocedure

The 'studiesecretariaat FALW' (tel. 020-5987010 / 020-5986939; e-mail: studiesecretariaat@falw.vu.nl ; room C118 (W&N-gebouw) handles course and exam enrollment and registration of grades (see TIS website).

Overige informatie

Due to the large amount of practicals, it is essential to know timely how many students will enroll. Students are advised to email the course coordinator (j.c.n.de.geus@vu.nl) that they aim to enroll, and to do so well before August 1.

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
Examinator	dr. J.F.H. Kupper
Docent(en)	dr. H. Wels, dr. B.J. Regeer, dr. J.F.H. Kupper
Lesmethode(n)	Hoorcollege, Werkgroep, Computerpracticum
Niveau	400

Doel vak

- Understanding the differences between beta- and gamma research;
- To acquire insight and understanding of a real world research process. This includes knowledge of the character of complex societal issues and the needs, advantages and disadvantages of real world research;
- 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 be able to make an adequate research design for the investigation of a specific complex societal 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 an 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 real world research: questionnaires, systematic observations using all the senses, surveys and statistics, semi-structured in-depth interviews, as well as focus groups. These methods are commonly used in 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, you 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 research design.

Onderwijsvorm

Lecture (20h), Training workshops (34h), Research project (107h), Examination (3h).

Toetsvorm

Group assignment (50%) and exam (50%). Both parts need to be graded 6 or higher.

Literatuur

Verschuren, D.E. and Doorewaard, H. (2010). Designing a Research Project (2nd edition)Eleven International Publishing, the Hague. ISBN 978-90-5931-572-3.

Gray, D.E. (2014) Doing Research in the Real World (3rd edition)Sage Publications Ltd, Los Angeles. ISBN 978-1-4462-6019-7

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 Marlous Arentshorst: m.e.arentshorst@vu.nl

Remodelling of the Circulatory System

Vakcode	M_CREMODE09 (3120001)
Periode	Periode 2

Credits	6.0
Voertaal	Engels
Faculteit	VUmc
Coördinator	prof. dr. J.W.M. Niessen
Examinator	prof. dr. J.W.M. Niessen
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	400

Inhoud vak

This course focuses on the pathophysiological mechanisms of vascular remodelling in pulmonary disease and ischemia.

The following topics will be addressed:

- pathophysiology of angiogenesis;
- vascular and cardiac effects of pulmonary hypertension;
- the role of fat tissue in vascular regulation;
- the effect of mechanical ventilation on the cardiovascular system.
- Basic aspects of atherosclerosis
- Immunology
- Therapy in cardiovascular disease

The course contains the following practical elements:

- 3D-life cell imaging of vascular cells;
- journalclub

Literatuur

relevant articles

Intekenprocedure

Students can register for this course and examinations via vunet.vu.nl (under My study, register for courses and exams). The general VU registration rules apply. Information on registration deadlines can be found in VUUnet. Please note that the general VU rules are strict, both for booking of the classes and (resit-)exams.

Overige informatie

Contact: j.w.m.niessen@vumc.nl

Research Methods for Need Assessments

Vakcode	AM_470817 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. D.R. Essink
Examinator	dr. D.R. Essink
Docent(en)	dr. M.B.M. Zweekhorst, dr. B.J. Regeer, dr. J.F.H. Kupper, dr. D.R. Essink, E.F. Maassen MSc
Lesmethode(n)	Hoorcollege, Werkgroep, Computerpracticum
Niveau	400

Doel vak

- The overall goal is to acquire insights, skills and attitudes regarding various quantitative and qualitative research methods used for conducting needs assessment, analysis of international public health problems, epidemiological investigation, field surveys to strengthen public health surveillances and understand the relative strengths and weaknesses of the various research methods
- To be able to make an adequate research design for the analysis of a specific health problem (theory, concepts and design)
- To acquire knowledge and skills in interview techniques, questionnaire design, and focus groups (data collection)
- To acquire insight in ways to involve community members and patients to include their views and jointly decide on the needs and priorities. This includes interactive and participatory methods for transdisciplinary research, such as focus groups, diagramming, mapping and other visualisation techniques (participative data collection)
- To know how to interpret quantitative and qualitative findings in the context of international public health (data analysis)

Inhoud vak

This course focuses on the knowledge, skills and attitude needed to design and conduct research in the field of international public health, with a specific focus on needs assessments. Before planning a health intervention, a thorough epidemiological, behavioural and social analysis of quality of life, health problems, health related behaviours, their causes and contributing factors should be conducted. The social context, environmental factors and community capacity should be investigated. To achieve results, it is necessary for health workers to (1) work with other sectors in a so called inter-sectoral approach, and (2) work with the community, since communities have relevant knowledge which increases the quality of the interventions and ownership of the implementation process. In other words, a transdisciplinary approach is required.

A variety of qualitative and quantitative methods can be employed. During this course the most essential research methods will be addressed and practiced: questionnaires, surveys and epidemiological statistics, semi-structured in-depth interviews, as well as several interactive and participatory methods, such as focus group discussions, diagramming, mapping and other visualisation techniques. Strengths and weaknesses of each research method and technique will be discussed, as well as the possibility to apply them in resource-poor settings and in different communities.

Throughout the course, students will apply the acquired theoretical knowledge by conducting and presenting their own mini-study in small groups.

Onderwijsvorm

'Research methods for needs assessments' is a fulltime course of four weeks (6 ECTS). 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 18.5 hours
- workshops and training 31.5 hours
- (project) self study 107 hours
- examination 3 hours

Attendance to the workshops and training is compulsory

Toetsvorm

The course grade is based on the study design and the exam. Both aspects have to be concluded with the grade of 5.5 or higher.

Exam : 50% of total grade

Study-Design: 50% of total grade

Literatuur

Verschuren, P. and Doorewaards, H. (2010) Designing a research project (2nd edition) Eleven International Publishing, The Hague.

Gray, D.E. (2014) Doing Research in the Real World (3rd edition) Sage Publications Ltd, Los Angeles.

Vereiste voorkennis

Knowledge of epidemiology and SPSS is a prerequisite to gain access to this course.

For further information please contact b.j.regeer@vu.nl.

Doelgroep

Compulsory course within the Master specialization International Public Health of the Master programmes Health Sciences and Biomedical Sciences. Optional course within the Master specialization Infectious Diseases (master programme Biomedical Sciences). In any other circumstances admission should be requested from the course coordinator.

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
Examinator	dr. B.J. Regeer
Docent(en)	dr. B.J. Regeer, dr. J.F.H. Kupper, B.M. Tielemans, P. Klaassen MA
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.

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
Examinator	dr. J.F.H. Kupper
Docent(en)	dr. J.F.H. Kupper
Lesmethode(n)	Werkgroep, Hoorcollege
Niveau	500

Doel vak

To gain knowledge of 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 reflective learning and mutual understanding

To acquire or improve:

- individual skills for effective interpersonal communication
- individual 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 self-evaluated by means of a reflection report.

Every course week is completed with a mini-exam.

Onderwijsvorm

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

Toetsvorm

Group assignment (50%), Take home exam (30%), Reflection report (20%). All assignments must be passed (grade > 6).

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 mandatory.

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
Examinator	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 of and insight into:

- the concepts, models and issues of science journalism according to contemporary scientific literature
- the criteria for effective science journalism with respect to diverse media
- the representation of science in the media
- the role of science journalism in the use of scientific 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

Several individual assignments (60%), several small group assignments (40%). All assignments must be passed (grade > 6).

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-specialisation 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 coördinator (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
Examinator	dr. B.J. Regeer
Docent(en)	dr. B.J. Regeer, drs. ir. M.G. van der Meij
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	500

Doel vak

- Gain insight in the role of museum exhibits in the field of science communication.
- Gain insight in the role of science communication concepts in the context of science museums.
- Apply qualitative research methods to design, conduct, and report on a user research project in museum settings.
- Apply theoretical notions of science communication and exhibit design to advise on adjustments and/or development of exhibitions.
- Gain experience in working for an external commissioner.

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 in museum settings, and will be introduced to different styles of communication, different approaches to exhibit design & development, and different methods of research and

evaluation of exhibitions.

Guest speakers and lecturers 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 informal science & technology learning environments.

Through individual and group assignments you are encouraged to combine theory and practice, working step-by-step towards (part of) an exhibition (re-)design. The group assignments are commissioned by 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 the assignments, 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 lectures from and excursions to for instance Artis, NEMO, Naturalis, NorthernLight, Museon, 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.

Intekenprocedure

General enrollment information:

The registration for this course consists of two steps:

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

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

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

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

Instructions for Blackboard enrollment:

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

Statistical Genetics for Gene Finding

Vakcode	AM_470734 ()
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Credits	5.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. J.J. Hottenga
Examinator	dr. J.J. Hottenga
Docent(en)	dr. J.J. Hottenga
Lesmethode(n)	Hoorcollege, Computerpracticum
Niveau	500

Doel vak

Provide practical skills for genetic linkage and association studies

Inhoud vak

The first part of the course will focus on parametric and non-parametric linkage analysis in pedigrees, with special emphasis on mendelian inheritance of complex phenotypes. The second part of the course will concentrate on genome-wide association studies (GWAS). With the advent of SNP microarray-chips that can map the largest part of the common genetic variance, GWAS have been playing a significant role in the field of genetics for the last couple of years. With higher resolution than the classical linkage studies, GWAS have been able to uncover many variants with small effects on complex traits. Besides teaching the main theoretical concepts underlying GWAS and linkage analysis, this course also includes the hands on training needed to handle the large amounts of data and statistical tests. In the practical you will prepare your data, run GWAS and linkage analyses, learn how to visualize and interpret the output and distinguish real signal from noise. The practicals include the use of Merlin, PLINK, haploview, WGA-viewer, Galaxy, SPSS.

Onderwijsvorm

Lectures, practical hands-on computer training

Toetsvorm

Weekly assignments (25%) & exam (75%). Practical needs to be completed in order to obtain a final grade.

Literatuur

To be announced on Blackboard

Vereiste voorkennis

Behavioral Genetics (AM_470732) & Complex Trait Genetics (AM_470733)

Statistical Genetics for Gene Finding

Vakcode	AM_1040 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. J.J. Hottenga
Examinator	dr. J.J. Hottenga
Docent(en)	dr. J.J. Hottenga, dr. L. Douw

Lesmethode(n)	Hoorcollege, Computerpracticum
Niveau	500

Doel vak

Provide practical skills for genetic linkage and association studies

Inhoud vak

The first part of the course will focus on parametric - and non-parametric linkage analysis in pedigrees, with special emphasis on Mendelian inheritance of complex phenotypes and the possible ways to analyze these data. In current and future genetics, linkage analysis remains an essential tool to analyse pedigrees for research as well as clinical genetics. The knowledge required is essential for any geneticist.

The second part of the course will concentrate on genome-wide association studies (GWAS). With the advent of SNP microarray-chips that can map an essential part of the common genetic variance, GWAS have been playing a significant role in the field of genetics for the last couple of years. With higher resolution than the classical linkage studies, GWAS have been able to uncover many variants with small effects on complex traits.

Besides teaching the main theoretical concepts underlying GWAS and linkage analysis, this course also includes the hands on training needed to handle the large amounts of data and statistical tests. In the practical you will prepare your data, run GWAS and linkage analyses, learn how to visualize and interpret the output and distinguish real signal from noise. The practicals include the use of Merlin, Qtdt, Plink, haploview, WGA-viewer, Galaxy, SPSS.

Onderwijsvorm

Lectures, practical hands-on computer training.

Note that the lectures will be essential to answer most of the examined knowledge.

Contact hours: 4x2 hours lecture + 4x4 hours practicals.

First two weeks: Linkage

Second two weeks: GWAS

Toetsvorm

Written exam

Literatuur

Statistical Genetics: Gene Mapping Through Linkage and Association.

Neale BM, Ferreira MAR, Medland SE, & Posthuma D (Eds.) Taylor and Francis, London (2007). (ISBN 9780415410403)

Abecasis GR, Cardon LR and Cookson WO. A General Test of Association for Quantitative Traits in Nuclear Families. *Am J Hum Genet* (2000) 66:279-292.

Abecasis GR, Cherny SS, Cookson WO and Cardon LR. Merlin-rapid analysis of dense genetic maps using sparse gene flow trees. *Nat Genet* (2002) 30:97-101.

Fulker DW, Cherny SS, Sham PC, Hewitt JK. Combined linkage and association sib-pair analysis for quantitative traits. *Am J Hum Genet*. 1999 Jan;64(1):259-67.

Purcell S, Neale B, Todd-Brown K, Thomas L, Ferreira MAR, Bender D,

Maller J, Sklar P, de Bakker PIW, Daly MJ & Sham PC (2007) PLINK: a toolset for whole-genome association and population-based linkage analysis. *American Journal of Human Genetics*, 81.

David J. Balding. A tutorial on statistical methods for population association studies. *Nature Reviews Genetics*. (2006) 7:781-791

Thomas A. Pearson; Teri A. Manolio. How to Interpret a Genome-wide Association Study. *JAMA*. 2008;299(11):1335-1344

Joel N.Hirschhorn and Mark J.Daly. Genome-Wide Association Studies for Common Diseases and Complex Traits. *Nature Reviews Genetics*. (2005) 6:95-108.

Treva K. Rice, Nicholas J. Schork, and D. C. Rao. Methods for Handling Multiple Testing. *Advances in Genetics*, Vol. 60, chapter 12.

Robert Plomin, Claire M. A. Haworth and Oliver S. P. Davis. Common disorders are quantitative traits. *Nature Reviews Genetics*, published online 27 october 2009.

John P. A. Ioannidis, Gilles Thomas and Mark J. Daly. Validating, augmenting and refining genome-wide association signals. (2009). *Nature Reviews Genetics*. 10:318-329.

Peter M. Visscher, Matthew A. Brown, Mark I. McCarthy, and Jian Yang. Five Years of GWAS Discovery. *The American Journal of Human Genetics* 90, 7–24, January 13, 2012

Additional literature involving recent techniques will be announced on Blackboard two weeks in advance of the course.

Vereiste voorkennis

Behavioral Genetics (AM_470732) & Complex Trait Genetics (AM_470733) & Basic Statistics.

Aanbevolen voorkennis

Variance components analysis, regression analysis.

Doelgroep

Any person interested in analyzing human DNA in relation to heritable (complex) traits: e.g., geneticists, molecular biologists.

Overige informatie

Additional useful information can be obtained from the following website links:

<http://pngu.mgh.harvard.edu/~purcell/plink/download.shtml>

<http://www.sph.umich.edu/csg/abecasis/Merlin/index.html>

<http://www.sph.umich.edu/csg/abecasis/qtdt/index.html>

Vascular Function and Metabolic Diseases

Vakcode	M_CVASCFU09 (3120002)
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	VUmc

Coördinator	dr. E.H. Serné
Examinator	dr. E.H. Serné
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	400

Doel vak

This course focuses on the fundamental role of inflammation, diabetes and hyperhomocysteinemia in vascular disease. Pathophysiology, new diagnostics and development of new therapies will be presented.

Inhoud vak

The following topics will be addressed: diabetes and vascular disease; diabetes and cardiac disease; hyperhomocysteinemia and vascular disease; inflammation and vascular disease: the role of sepsis; diagnostics of vascular complications; endovascular surgery as a new therapy in vascular disease.

The course contains the following practical elements: in vivo assessment of vascular function in humans; flow- cytometry of inflammatory cells / mediators; isolation and culture of endothelial cells; protein analysis & proteomics in vascular disease.

Toetsvorm

Written exam and assignments

Literatuur

Book: to be announced;
syllabus including relevant articles.

Intekenprocedure

Students can register for this course and examinations via vunet.vu.nl (under My study, register for courses and exams). The general VU registration rules apply. Information on registration deadlines can be found in VUnet. Please note that the general VU rules are strict, both for booking of the classes and (resit-)exams.

Viral Oncogenesis

Vakcode	M_OVIRONC03 (311168)
Periode	Periode 4
Credits	3.0
Voertaal	Engels
Faculteit	VUmc
Coördinator	prof. dr. J.M. Middeldorp
Examinator	prof. dr. P.J.F. Snijders
Lesmethode(n)	Hoorcollege
Niveau	500

Doel vak

The aim of the course is to give students an up-to-date insight into the mechanism of viral oncogenesis in humans.

Inhoud vak

The subjects of the course may include several of the following issues:
General aspects of DNA and RNA tumour viruses

Human papillomavirus (HPV) and cervical cancer
Hepatitis B/C viruses (HBV/HCV) and hepatocellular carcinoma
Human papillomavirus (HPV) and non-melanoma skin cancer
Epstein Barr virus (EBV) in lymphoma and carcinoma
Human Herpes Virus 8 (HHV8) and Kaposi's sarcoma

Onderwijsvorm

6-12 contact hours. In addition the course consists of independent learning on the basis of a literature study on selected topics. Introduction session with basic lectures will be provided by the teachers. Question time with the teachers to decide in consultation.

Toetsvorm

The course will be concluded by group presentations on literature studies (3 hours). Moreover, findings on literature studies should be summarized in a short written summary to be delivered at the end of the course.

Literatuur

Literature consists of recent (review) papers in the field of viral oncogenesis.

Doelgroep

This course is optional for students of the Master Course in Oncology who have completed three compulsory courses of the Master Course in Oncology.

Intekenprocedure

Students can register for this course and examinations via vunet.vu.nl (under My study, register for courses and exams). The general VU registration rules apply. Information on registration deadlines can be found in VUnet. Please note that the general VU rules are strict, both for booking of the classes and (resit-)exams.

Overige informatie

After the course the students will have thorough knowledge and in depth insight into:
the fundamental processes which play a role in viral oncogenesis
the mechanisms of the various oncogenic viruses
the translation of fundamental research into clinical applications
Apply per email to the coordinator of the Master's Programme in Oncology.