



Biomedical Sciences MSc

Vrije Universiteit Amsterdam - Fac. der Aard- en Levenswetenschappen - M Biomedical Sciences - 2016-2017

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.

The student can choose from the following specializations:

First and/or second year Research specializations (54-60 EC):

- Immunology
- Infectious Diseases
- Neurobiology

Second year Research specializations (54-60 EC), only for students that started in study year 2014-2015 or earlier:

- Medical and Behavioural Genomics
- Psychophysiology

The I/C/S/E specializations are only available in the second year of the master:

- International Public Health (54 EC)
- Science Communication specialization (54 EC)
- Specialization Science in Society (54 EC)
- Education specialization (60 EC)

The I/C/S/E 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 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 Sciences

The course programme components presented in the list below will no longer be part of the examination programme in academic year 2015-2016.

Opleidingsdelen:

- [MSc Biomedical Sciences, spec. Medical and Behavioural Genomics](#)
- [MSc Biomedical Sciences, spec. Psychophysiology](#)

MSc Biomedical Sciences, spec. Medical and Behavioural Genomics

The Master's graduate with a specialization in Medical and Behavioral Genomics (only for students that started in study year 2014-2015 or earlier) 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.

The prescribed scope of the research specializations is 54-60 EC, including:

- research internship (30 EC)
 - at least 3 courses from the specialization (18 EC)
 - choice (6-12EC) from:
 - o literature thesis in the field of the specialization (9 EC);
 - o an extra optional course of the specialization (6 EC)
 - o an extension of the internship (3-6 EC)*
- * The total EC for both internships together may not exceed 66EC.

The course programme consists of the following components, with the study load for each component given in EC.

Opleidingsdelen:

- [Expired course modules specialization](#)

Expired course modules specialization

Vakken:

Naam	Periode	Credits	Code
Complex Trait Genetics	Periode 1	6.0	AM_470733
Genomic Data Analysis	Periode 2	6.0	AM_1008
Internship Med. and Behavioural Genomics	Ac. Jaar (september)	30.0	AM_471142
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 (only for students that started in study year 2014-2015 or earlier) 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.

The prescribed scope of the research specializations is 54-60 EC, including:

- research internship (30 EC)
- at least 3 courses from the specialization (18 EC)
- choice (6-12EC) from:
 - o literature thesis in the field of the specialization (9 EC);
 - o an extra optional course of the specialization (6 EC)
 - o an extension of the internship (3-6 EC)*

* The total EC for both internships together may not exceed 66EC.

The course programme consists of the following components, with the study load for each component given in EC.

Opleidingsdelen:

- [Expired course modules specialization](#)

Expired course modules specialization

Vakken:

Naam	Periode	Credits	Code
Experimental and Clinical Neuroendocrinology	Periode 2	6.0	AM_470700
Functional Brain Imaging	Periode 1	6.0	AM_470715
Internship Psychophysiology	Ac. Jaar (september)	30.0	AM_471140
Psychophysiology	Periode 1	6.0	AM_470736
Rhythms of the Brain	Periode 2	6.0	AM_1003

MSc Biomedical Sciences, Research Specializations year 1 and/or 2

The prescribed scope of the research specializations is 54-60 EC, including:

- research internship (30 EC)
- at least 3 courses from the specialization (18 EC)

- choice (6-12EC) from:
 - o literature thesis in the field of the specialization (9 EC);
 - o an extra optional course of the specialization (6 EC)
 - o an extension of the internship (3-6 EC)*
- * The total EC for both internships together may not exceed 66EC.

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).

First and/or second year Research specializations (54-60 EC):

Immunology
 Infectious Diseases
 Neurobiology

Second year Research specializations (54-60 EC), only for students that started in study year 2014-2015 or earlier:

Medical and Behavioural Genomics
 Psychophysiology

Opleidingsdelen:

- [MSc Biomedical Sciences, spec. Immunology](#)
- [MSc Biomedical Sciences, spec. Infectious Diseases](#)
- [MSc BMED spec. Neurobiology](#)

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.

The prescribed scope of the research specializations is 54-60 EC, including:

- research internship (30 EC)
- at least 3 courses from the specialization (18 EC)
- choice (6-12EC) from:
 - o literature thesis in the field of the specialization (9 EC);
 - o an extra optional course of the specialization (6 EC)
 - o an extension of the internship (3-6 EC)*
- * The total EC for both internships together may not exceed 66EC.

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.

The prescribed scope of the research specializations is 54-60 EC, including:

- research internship (30 EC)
 - at least 3 courses from the specialization (18 EC)
 - choice (6-12EC) from:
 - o literature thesis in the field of the specialization (9 EC);
 - o an extra optional course of the specialization (6 EC)
 - o an extension of the internship (3-6 EC)*
- * The total EC for both internships together may not exceed 66EC.

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
Microbial Genomics	Periode 3	3.0	AM_1021
Parasitology	Periode 2	6.0	AM_470052

MSc BMED spec. Neurobiology

The prescribed scope of the research specializations is 54-60 EC, including:

- research internship (30 EC)
 - at least 3 courses from the specialization (18 EC)
 - choice (6-12EC) from:
 - o literature thesis in the field of the specialization (9 EC);
 - o an extra optional course of the specialization (6 EC)
 - o an extension of the internship (3-6 EC)*
- * The total EC for both internships together may not exceed 66EC.

The course programme consists of the following components, with the study load for each component given in EC.

Opleidingsdelen:

- [Optional Courses Neurobiology: 6 EC required](#)
- [Compulsory courses Neurobiology](#)

Optional Courses Neurobiology: 6 EC required

Vakken:

Naam	Periode	Credits	Code
Behavioral Genetics	Periode 2	6.0	AM_1006
Clinical Neurosciences	Periode 2	6.0	AM_1005

Compulsory courses Neurobiology

Vakken:

Naam	Periode	Credits	Code
Data Analysis and Visualisation	Periode 1	6.0	AM_1191
From Molecule to Mind	Periode 1	6.0	AM_1190
Internship Neurobiology	Ac. Jaar (september)	30.0	AM_1178

MSc Biomedical Sciences, Second Year ICSE Specializations

The I/C/S/E specializations are only available in the second year of the master:

- International Public Health (54 EC)
- Science Communication specialization (54 EC)
- Specialization Science in Society (54 EC)
- Education specialization (60 EC)

Based on the assumption that Master's students following an ICSE specialization should also have research experience, the research specialization consists of at least 57 EC and should include a biomedical research internship (30EC).

Opleidingsdelen:

- [MSc Biomedical Sciences, Communication Specialisation](#)
- [Biology](#)
- [MSc Biomedical Sciences, spec. International Public Health](#)
- [MSc Biomedical Sciences, Spec. Science in Society](#)

MSc Biomedical Sciences, Communication Specialisation

Biomedical science is increasingly becoming an interdisciplinary research field in which biomedical scientists can no longer function effectively in isolation. Rather, they benefit from interaction with other scientists (such as those in the fields of molecular biology, neurobiology and immunobiology) and societal actors (such as doctors, patients and policymakers). Communication about science takes place between academic peers and between scientists and the general public. This makes the Communication specialization a complex and dynamic field of research and practice, for example on patient participation in health research, the use and effects of media metaphors and hype, and public

understanding of emergent technologies. The Master's graduate with this specialization has a theoretical understanding of the complex problems that arise during such communication processes, and has developed the necessary skills to act professionally at this interface to enhance communication and the outcomes of communication between scientific actors and society.

The prescribed scope of the Communication specialization is 54 EC, including:

- o Internship (30 EC)
- o At least 4 courses from the specialization (24 EC)

Opleidingsdelen:

- [Compulsory courses](#)
- [Choose at least two of these courses](#)
- [Choose one of these courses](#)

Compulsory courses

Vakken:

Naam	Periode	Credits	Code
Research methods for analyzing complex problems	Periode 1	6.0	AM_1182
Science and Communication	Periode 1	6.0	AM_470587

Choose at least two of these courses

Vakken:

Naam	Periode	Credits	Code
Communication, Organization and Management	Periode 2	6.0	AM_470572
Science in Dialogue	Periode 2	6.0	AM_1002
Science Journalism	Periode 2	6.0	AM_471014
Science Museology	Periode 3	6.0	AM_470590

Choose one of these courses

Vakken:

Naam	Periode	Credits	Code
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Reflective Practice Internship Science Communication	Ac. Jaar (september)	30.0	AM_1163
Research Internship Science Communication	Ac. Jaar (september)	30.0	AM_1162

Biology

The Master's graduate with a specialization in Education obtains a certificate that qualifies the graduate to teach Biology in secondary schools (this is a 'grade one' certificate, i.e. it qualifies the graduate to teach pupils who will sit public exams in the subject).

The programme for the Education specialization essentially consists of one year of specific teacher training. This 60 EC-programme is taught in Dutch. Note that the Education Specialization is identical to the Master's in 'Leraar Voorbereidend Hoger Onderwijs - Biologie' that can be followed in addition to a research Master's in Biology or the Biomedical Sciences. The programme can be started twice a year, in September and February.

For courses and more information on the Education specialization: www.psy.vu.nl/nl/opleidingen/masteropleidingen/universitaire-lerarenopleiding.

The prescribed scope of the Education specialization is 60 EC

Opleidingsdelen:

- [Master Leraar VHO Biologie vanaf 2015](#)
- [LVHO Biologie, overgangsregels](#)

Master Leraar VHO Biologie vanaf 2015

Vakken:

Naam	Periode	Credits	Code
Didactiek 1	Periode 1	6.0	O_MLDIDAC_1
Didactiek 2	Periode 2+3	6.0	O_MLDIDAC_2
Didactiek 3	Periode 1+2+3, Periode 4+5+6	9.0	O_MLDIDAC_3
Peergroup fase 1	Periode 1+2+3	0.0	O_MLPEERGR_1
Peergroup Fase 2	Periode 3+4+5	0.0	O_MLPEERGR_2
Praktijk 1	Periode 1	6.0	O_MLPRAK_1
Praktijk 2	Periode 2+3	9.0	O_MLPRAK_2
Praktijk 3	Periode 1+2+3, Periode 4+5+6	15.0	O_MLPRAK_3
Praktijkonderzoek 1	Periode 3	3.0	O_MLPROZ_1
Praktijkonderzoek 2	Periode 1+2+3, Periode 4+5+6	6.0	O_MLPROZ_2

LVHO Biologie, overgangsregels

Vakken:

Naam	Periode	Credits	Code
Praktijk I	Ac. Jaar (september)	15.0	O_MLPRAKI
Praktijk II	Ac. Jaar (september)	15.0	O_MLPRAKII
Professionele ontwikkeling en onderzoek I	Ac. Jaar (september)	3.0	O_MLVPOOI

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.

The prescribed scope of the IPH specialization is 54 EC, including:

- o Internship (30 EC)
- o At least 4 courses from the specialization (24 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 contact the master's coordinator or specialization coordinator for options.

Opleidingsdelen:

- [MSc Biomedical Sciences, spec. International Public Health](#)
- [MSc Biomedical Sciences, spec. International Public Health](#)

MSc Biomedical Sciences, spec. International Public Health

Vakken:

Naam	Periode	Credits	Code
Containment Strategies of Infectious Diseases in Global Context	Periode 1	6.0	AM_470127

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. International Public Health

Vakken:

Naam	Periode	Credits	Code
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

MSc Biomedical Sciences, Spec. Science in Society

The Master's graduate with a specialization Science in Society 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 prescribed scope of the Science in Society specialization is 54 EC, including:

- o Internship (30 EC)
- o At least 4 courses from the specialization (24 EC)

Opleidingsdelen:

- [MSc BMED spec. Science in society - compulsory courses](#)
- [Choose at least one of these courses](#)

MSc BMED spec. Science in society - compulsory courses

Vakken:

Naam	Periode	Credits	Code
Analysis of Governmental Policy	Periode 1	6.0	AM_470571
Communication, Organization and Management	Periode 2	6.0	AM_470572
Internship Science in Society	Ac. Jaar (september)	30.0	AM_1133
Research methods for analyzing complex problems	Periode 1	6.0	AM_1182

Choose at least one of these courses

Vakken:

Naam	Periode	Credits	Code
Business Management in Health and Life Sciences	Periode 2	6.0	AM_470584
Clinical Development and Clinical Trials	Periode 3	3.0	AM_1180
Disability and Development	Periode 2	6.0	AM_470588
Epidemiology	Periode 3	3.0	AM_1179
Health, Globalisation and Human Rights	Periode 2	6.0	AM_470818
Policy, Politics and Participation	Periode 2	6.0	AM_470589
Science in Dialogue	Periode 2	6.0	AM_1002

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 Engl (AM_BMED)	Periode 3+4+5+6	3.0	AM_1161B

Internship for students without spec.

Vakken:

Naam	Periode	Credits	Code
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Internship Biomedical Sciences- no spec.	Ac. Jaar (september)	30.0	AM_471158
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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. R.E. Mebius
Examinator	prof. dr. R.E. Mebius
Docent(en)	drs. K. Brouwer, prof. dr. R.E. Mebius, prof. dr. Y. van Kooyk, dr. T. van der Pouw Kraan, prof. dr. H.E. de Vries, dr. ing. S.J. van Vliet, dr. R.M. Reijmers
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 rapid 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, particular 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 (H; 22 hours) and study groups (W; 14 hours). 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 (pro; 4 hours), 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.

Contact hours with teachers and/ or coordinators: 40

Toetsvorm

A written exam (T) at the end of the course includes essay ('open') (90% of grade). A minimum score of 5.5 for the written exam is required in order to pass.

The research proposal (Pres) has to be presented and accounts for 10% 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. A bachelor's course immunology is recommended.

Lecturer(s):

prof. dr. R.E. Mebius, prof. dr. M. van Egmond, prof. dr. H.E. de Vries,

Analysis of Governmental Policy

Vakcode	AM_470571 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. O.E. Popa
Examinator	dr. O.E. Popa
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 parttime course of eight weeks (6 ECTS). The most recent course schedule is to be found on Blackboard.

Tuition methods include lectures, training workshops, and self-study.

The different elements have the following study time:

- lectures: 15 hours
- project and self-study: remaining hours (including coach meetings)
- 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%)). All parts have 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 research design made and lessons learned from the first compulsory MPA course: Research Methods for Analyzing Complex Problems

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.

Intekenprocedure

Additional information about the schedule for work groups is available in BlackBoard.

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 tutors.

Behavioral Genetics

Vakcode	AM_1006 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	R.S.L. Ligthart
Examinator	R.S.L. Ligthart
Docent(en)	dr. C.M. Middeldorp, R.S.L. Ligthart
Lesmethode(n)	Hoorcollege, Computerpracticum

Doel vak

To provide the Master of Neuroscience students with a solid basis in human behavioral genetic research. This entails:

- A good understanding of the most commonly used methods in behavioral genetics (including twin studies, genetic linkage and genome-wide association studies)
- The ability to critically read and understand behavioral genetic research articles
- Familiarity with the most important research findings in the field
- Familiarity with the most common software programs used in this field of research.

Inhoud vak

Behavior genetics focuses on the inheritance of individual differences in complex traits. Such traits are most likely influenced by multiple genetic and environmental factors. The effects of genetic and environmental factors may be additive or interactive and lead to individual differences in complex traits and diseases that are quantitative rather than qualitative. In this course theory and principles from population genetics and biometrical genetics will be introduced, including genetic and cultural inheritance of complex phenotypes. Designs of family, adoption and twin studies and their applications to variation in cognitive abilities, personality and psychiatric disease will be discussed. The advances in molecular genetics have generated substantial progress in identifying the genetic basis of heritable traits using linkage and genome-wide association approaches. Both approaches will be reviewed and illustrated using recent studies aiming to identify genes underlying the vulnerability for psychiatric disorders, such as schizophrenia and mood disorders. Practical exercises will guide the student through some of the available online tools that facilitate the interpretation of gene-finding studies.

Onderwijsvorm

Lectures (6, 2 hours each) and computer practicals (6, 3 hours each).

Toetsvorm

Written exam consisting of open-end questions (60%) + writing assignment (40%).

To obtain a final grade of 6 or higher, students have to pass both the exam and the writing assignment.

Literatuur

Research articles, exact reading list to be announced on blackboard 2 weeks before the course.

Vereiste voorkennis

Students from disciplines other than neuroscience should contact the course coordinator to discuss the possibility of entry in this course.

Doelgroep

First year students of the master neuroscience and students interested in behavioral genetic research (e.g. twin studies or gene-finding methods, with a focus on behavioral phenotypes).

Overige informatie

Attending the practicals is compulsory

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	drs. A.M.G. Neevel BSc
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 knowledge and understanding into theory of knowledge valorisation in health and life sciences

To acquire knowledge and insight in how to organise, protect and finance a business in health and life sciences

To acquire knowledge and understanding into the pharmaceutical industry's business model and business processes

To acquire knowledge and understanding into the challenges that face the pharmaceutical industry

To apply newly acquired knowledge and understanding by solving case examples

To reflect on and critically evaluate the role of the pharmaceutical industry in the healthcare system

To apply newly acquired knowledge and understanding in writing a business plan

To learn to autonomously write a business plan

Inhoud vak

As a result of external factors (for example ageing of the population and technological advancement, leading to increased healthcare costs), it is being stated that our healthcare system is under pressure. As a central stakeholder in this healthcare system, the pharmaceutical industry is facing significant challenges the coming years. More than ever, the pharmaceutical industry is challenged to survive. Business Management in the Health and Life Sciences focuses on gaining insight in the pharmaceutical industry, its business model, business processes, challenges, as well as strategies and actions to overcome these challenges.

During the course, prof.dr. Eric Claassen

(<http://www.falw.vu.nl/en/research/athena-institute/staff/claassen.asp>)

together with highly experienced guest lecturers from the field will teach theoretical and practical knowledge during lectures and seminars.

Tangible subjects that will be discussed during the lectures and seminars include the pharmaceutical industry's business model and business processes, 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 newly acquired knowledge is tested via an assignment (during which students will write either a personal career business plan or a 'real' business plan) (40% of the total grade), a written exam (40% of the total grade), and two computer seminars (both counting for 10% of the final grade).

Onderwijsvorm

Lectures: +-50 h

Computer seminars: 7,5 h

Work on assignment and self-study: +- 40h

Toetsvorm

Written exam: 40%

Personal Business Plan: 40%

Computer seminars (2): 20%

All parts have to be passed successfully.

Literatuur

- Osterwalder, A. & Pigneur, Y. (2009). Business model generation. Self-published.
- Kubr, Marchesi & Ilar (McKinsey & company). (1998). Starting up. Achieving success with professional business planning. McKinsey & Company, Inc. The Netherlands, Amstel 344, 1017 AS Amsterdam.

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, companies/organisations:

- Robert Al, TU Eindhoven
- Tamar Weenen, VU university
- Esther Pronker, RIVM
- Patrick de Boer & Jochem Bosschenbroek, Ttopstart BV
- Bart van Weezenbeek, Verenigde
- Bart Bergstein, Forbion Capital partners
- Michael Mellink & Majorie Soeter, Odgers Berndtson: international executive search
- Marga Janse, Innovatief LerenLeren BV
- Yp Kroon & Peter van Dongen, NL Octrooicentrum
- Jeroen Dekker, Price Waterhouse Coopers
- Arjan Bisseling, AsjesBisseling Belastingadviseurs

Clinical Development and Clinical Trials

Vakcode	AM_1180 ()
Periode	Periode 3
Credits	3.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	drs. A.M.G. Neevel BSc
Examinator	prof. dr. H.J.H.M. Claassen
Docent(en)	prof. dr. H.J.H.M. Claassen

Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	500

Doel vak

- to gain knowledge and insight into the function clinical trials in today's healthcare system
- to gain knowledge and insight into the design of clinical trials
- to gain knowledge and insight into the conduct of clinical trials, including the applying rules and regulations (including ICH-GCP)
- to gain knowledge and insight into and critically reflect on the roles, tasks and responsibilities of the stakeholders involved in clinical trials
- to gain insight into challenges in clinical development as well as in strategies to deal with these challenges
- to learn where and how to look up rules and regulations

Inhoud vak

In today's healthcare system, clinical trials have gained the status of golden standard to test the safety and efficacy of newly developed drugs. For new drugs to enter the market, clinical trials must be passed and as a consequence, clinical trial outcomes have major effects on our healthcare system. While our healthcare system currently is under pressure to remain affordable and available to all, at the same time, clinical trial regulations are increasingly tightened and the prominence of clinical trials in our healthcare system is being criticized. For that matter, it is of great importance to learn about and reflect on the role of clinical trials in today's healthcare system.

The Clinical Development & Clinical Trials course will elaborate on the function, design and conduct of clinical trials, as well as the relevant stakeholders involved. The course consists of a theoretical part and an important practical part (e.g. gaining knowledge on clinical trial regulations). Classes include for example: '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'.

The gained knowledge and skills will be evaluated by means of a written exam at the end of the course.

Onderwijsvorm

Lectures: +-35 h
Self study: +- 40 h

Toetsvorm

Written exam: 100%

Literatuur

Arezina R, Wang D. (2006). Clinical Trials: A practical guide to design, analysis and reporting. London: Remedica.
(Additional reading will be provided via Blackboard and will serve as background reading for the lectures).

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/companies:

- Eric Klaver, FourPlus Clinical

Clinical Immunology

Vakcode	AM_470655 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	J.J. Garcia Vallejo BSc
Examinator	prof. dr. Y. van Kooyk
Docent(en)	drs. K. Brouwer, dr. C.J.J. Mulder, dr. B.W. van Oosten, prof. dr. P. van der Valk, dr. E.J.G. Peters
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 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

Lecturers:

Prof. dr. C.J.J. Mulder, dr. E.J.G. Peters, dr. B.W. van Oosten, dr. B. de Jong, prof. dr. H.E. de Vries, prof. dr. J. van Horssen, prof. dr. P. van der Valk, dr. M. Bögels, dr. H. Bontkes, prof. dr. T.D. de Gruijl, prof. dr. Y. van Kooyk

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)

Prof. dr. B 't Hart (UMCG)

Clinical Neurosciences

Vakcode	AM_1005 ()
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Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	M.M. Schoonheim
Examinator	M.M. Schoonheim
Docent(en)	M.M. Schoonheim, dr. D.P. Bakker
Lesmethode(n)	Hoorcollege, Practicum
Niveau	400

Doel vak

The aim of this course is twofold: 1. Provide knowledge on neurological disease, and 2. Initiate a translational way of thinking as a neuroscientist. To do this, we will provide knowledge on common neurological disorders: Dementias, movement disorders, multiple sclerosis, childhood white matter disorders and neuropsychiatric disorders. Translational thinking will be stimulated by continuously investigating the (histo)pathology, clinical and imaging abnormalities for diagnosis and prognosis and therapeutic options.

Inhoud vak

Dementias:

Description of the main clinical manifestations of dementia.

Introduction of cognitive assessment in dementias. Demonstration of the neuropathological features of dementias.

Movement disorders:

Description of the motor and cognitive manifestations of movement disorders. During this course the focus will be on Parkinson's disease.

Multiple sclerosis:

Description of the clinical phenotypes of the disease. Introduction of neuroimaging specifically adapted for MS. The use of neuropathology to understand disease mechanisms in MS.

Childhood white matter disorders:

Introduction in MRI pattern recognition in childhood white matter disorders. Demonstration of translational research: from patient to gene, protein and treatment.

Neuropsychiatric disorders:

Description of the clinical manifestation of the main neuropsychiatric disorders in a broad translational way; from molecule to mind. Introduction of the underlying neuroanatomy and pathophysiology and discussion on what the use is of neuroimaging in neuropsychiatry.

Onderwijsvorm

Lectures, student presentations, practical

The course is four weeks, and also includes a visit to the Netherlands Institute for Neuroscience (NIN)

Toetsvorm

Group presentation

Written exam with open questions

Literatuur

Research papers and course slides provided on blackboard

Vereiste voorkennis

All students following the masters program in Neurosciences at the VU are required to take this course.

External candidates are also allowed, if accepted by the course coordinator.

Aanbevolen voorkennis

For external candidates, some basic knowledge of neuroanatomy would be very helpful.

Doelgroep

Students interested in clinical neuroscience

Intekenprocedure

Through the VU FALW office

Overige informatie

Questions: clinicalneuroscience@vumc.nl

This course is coördinated by: dr. D.P.Bakker (Dewi) and Dr. M.M. Schoonheim (Menno)

Communication, Organization and Management

Vakcode	AM_470572 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. E. Muniz Pereira Urias
Examinator	dr. E. Muniz Pereira Urias
Docent(en)	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. 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
 Training workshops 16 hours
 Self-study and writing project assignment: remaining hours.

Toetsvorm

Written exam (60%;) and assignment (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/discussions is indispensable

Lecturers:

dr. M.J. Kishna

guest lectures will be announced on Blackboard

Complex Trait Genetics

Vakcode	AM_470733 ()
Periode	Periode 1
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	dr. D.R. Essink

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 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.

Slide sets of lectures as made available on BlackBoard

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 Steenberg (RIVM/LUMC)

Dr. Helma Ruijs (RIVM)

Dr Frank Cobelens (KNCV)

Dr. Constance Schultsz (AIGHD/AMC)

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. Christina Vandenbroucke (VUMC) Minor course AB_1046 "Infectious Diseases and Vaccine Development"

Data Analysis and Visualisation

Vakcode	AM_1191 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. C.V. Dolan
Examinator	dr. C.V. Dolan

Lesmethode(n)	Hoorcollege, Computerpracticum
Niveau	400

Didactiek 1

Vakcode	O_MLDIDAC_1 ()
Periode	Periode 1
Credits	6.0
Voertaal	Nederlands
Faculteit	Fac. der Gedrags- en Bewegingswetensch.
Coördinator	C.L. Geraedts
Examinator	C.L. Geraedts
Docent(en)	drs. J.K.W. Riksen, drs. H.R. Goudsmit, drs. Y.G. Meindersma, ir. E.J.F. Scheringa, drs. I. Pauw, drs. C.D.P. van Oeveren, drs. S. Donszelmann, drs. B. Klein, dr. H.B. Westbroek, C.L. Geraedts, dr. A.A. Kaal, dr. A. Handelzalts, drs. K.L. Schaap, dr. B. de Vries, drs. A.J.C. Monquil, dr. J.G.M. van der Aalsvoort, drs. J.B. Penninx, W. Maas, F.L. de Vries MSc, drs. H. Stouthart, drs. E.D. van Noort, drs. N.H. Ypenburg, drs. J. Quartel
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	400

Doel vak

De cursus Didactiek 1 is onderdeel van de eerste fase (fase I) van de Universitaire Lerarenopleiding (ULO) van de VU, en loopt parallel aan de cursus Praktijk 1. De cursus is breed van opzet en omvat verschillende onderdelen die in samenhang worden aangeboden: algemene didactiek (AD), vakdidactiek (VD) en peergroup (PG).

Aan het eind van de cursus heeft de student de nodige basale algemeen didactische en vakdidactische bagage aan te reiken die nodig is voor het handelen als docent in simpele en overzichtelijke situaties op niveau van één les. Hierbij wordt nadrukkelijk aangesloten bij de ontwikkelingsfase waarin de docent-in-opleiding (dio) zich bevindt (zie inhoud).

Inhoud vak

De cursus is geordend rondom zogeheten kernpraktijken die fundamenteel zijn voor het beroep van docent. Bij Didactiek 1 staan de volgende kernpraktijken centraal: (1) contact maken, (2) de les starten en aandacht richten, (3) krediet opbouwen en uitgeven, (4) de les voorbereiden, (5) sturen en corrigeren en (6) volledige instructie geven en de les afsluiten. De reikwijdte van het didactisch denken en handelen is in deze eerste fase meestal nog beperkt tot één les. De genoemde kernpraktijken komen expliciet aan de orde bij AD. Bij VD wordt aangesloten bij deze kernpraktijken en wordt de vertaalslag gemaakt naar het eigen (school)vak. Daarnaast worden bij VD belangrijke vakdidactische concepten en werkwijzen geïntroduceerd

Bij PG staat de eigen onderwijspraktijk van de docent-in-opleiding (dio) centraal. Concrete vragen en situaties uit de praktijk vormen aanleiding tot analyse en reflectie. Waar bij AD en VD de nadruk ligt op de rollen

van de uitvoerende en ontwerpende docent en pedagoog, wordt bij PG nadrukkelijk vorm gegeven aan de rol van onderzoekende professional.

De ervaring leert dat de kernpraktijken die bij Didactiek 1 centraal staan bij de meeste dio's uitgebreid aan de orde komen tijdens het eerste deel van de praktijkstage (Praktijk 1). Alle inhoudscomponenten uit deze cursus worden tijdens de bijeenkomsten en in verwerking verbonden met de werkplekpraktijk van de student. De dio en de werkplekbegeleider krijgen ook suggesties voor (observatie)opdrachten die kunnen bijdragen aan de ontwikkeling van de competenties die bij deze kernpraktijken horen.

Onderwijsvorm

Alle onderwijs vindt plaats op de instituutsdag (maandag). Studenten zijn de hele dag aanwezig. In de ochtend is er een hoor/werkcollege AD, waarbij dio's van verschillende vakken samen zitten. De colleges AD worden steeds verzorgd door een tweetal docenten. In de middag is er een werkcollege VD onder begeleiding van de vakdidacticus. Deze colleges worden samen met dio's van hetzelfde vak in verschillende samenstellingen (homogeen en heterogeen) gevolgd.

Tenslotte zijn er, verspreid over de periode, drie PG bijeenkomsten, waarbij dio's van verschillende vakken in kleine groepen en onder begeleiding de eigen onderwijspraktijk onder de loep nemen en eventuele concerns daarbij bespreken.

Bij alle onderdelen (AD, VD en PG) wordt een actieve houding van de student gevraagd, zowel tijdens de bijeenkomsten als daarbuiten. Regelmatig worden er verwerkingsopdrachten gegeven, waar individueel of in groepsverband aan wordt gewerkt. Deze opdrachten worden formatief geëvalueerd, onder andere door middel van (peer)feedback.

Toetsvorm

Didactiek 1 wordt afgesloten met een geschreven mini-proef waarin de studenten demonstreren dat zij één les kunnen ontwerpen en uitvoeren en kunnen reflecteren op de manier waarop voorbereiding, uitvoer en afronding hebben plaatsgevonden. De proef bestaat uit een lesontwerp (incl. verantwoording op basis van praktijk en theorie, en eigen leerdoelen bij deze les), een videocompilatie (15 min.) van de gegeven les en een terugblik op de les. Bij het ontwerpen en uitvoeren van de les staan de kernpraktijken behandeld in de colleges algemene didactiek en vakdidactiek centraal (met een focus op de les en de leerling). De terugblik op ontwerp en uitvoering vindt plaats aan de hand van de reflectiecirkel van Korthagen, de perspectieven van een docent als professional, ontwerper, uitvoerder, pedagoog en teamlid en de daarbij behorende relevante theorie. De proef wordt beoordeeld aan de hand van een beoordelingsmodel gerelateerd aan de rubrics die voor elk van de docentperspectieven zijn geformuleerd voor fase 1.

Literatuur

Bij deze cursus worden de volgende algemeen didactische handboeken gebruikt:

- Ebbens, S. & Ettekoven, S. (2012). Effectief leren – basisboek. Groningen: Noordhoff Uitgevers B.V.
- Korthagen, F. & Lagerwerf, B. (2014). Een leraar van klasse. Den Haag: Boom Lemma Uitgevers
- Teitler, P. (2013). Lessen in orde. Bussum: Coutinho.
- Kohnstamm, R. (2014). Kleine ontwikkelingspsychologie: III de puberjaren. Houten: Bohn Stafleu van Loghum.

Behalve van bovenstaande literatuur wordt veelvuldig gebruik gemaakt van relevante en actuele wetenschappelijke literatuur. Deze artikelen worden tijdens de cursus ter beschikking gesteld. De literatuur die bij VD gebruikt wordt is afhankelijk van het schoolvak waarvoor wordt opgeleid.

Overige informatie

Beheersing van de inhoud van het desbetreffende schoolvak wordt als voorkennis verondersteld.

Didactiek 2

Vakcode	O_MLDIDAC_2 ()
Periode	Periode 2+3
Credits	6.0
Voertaal	Nederlands
Faculteit	Fac. der Gedrags- en Bewegingswetensch.
Coördinator	drs. L.J. van Well-van Grootheest
Examinator	drs. L.J. van Well-van Grootheest
Docent(en)	drs. J.K.W. Riksen, drs. H.R. Goudsmit, drs. Y.G. Meindersma, ir. E.J.F. Scheringa, drs. I. Pauw, drs. C.D.P. van Oeveren, drs. S. Donszelmann, drs. B. Klein, dr. H.B. Westbroek, C.L. Geraedts, dr. A.A. Kaal, dr. A. Handelzalts, drs. K.L. Schaap, dr. B. de Vries, drs. A.J.C. Monquil, dr. J.G.M. van der Aalsvoort, drs. J.B. Penninx, W. Maas, F.L. de Vries MSc, drs. H. Stouthart, drs. E.D. van Noort, drs. N.H. Ypenburg, drs. J. Quartel
Lesmethode(n)	Werkgroep, Hoorcollege
Niveau	400

Doel vak

De cursus Didactiek 2 is onderdeel van de tweede fase (fase II) van de Universitaire Lerarenopleiding (ULO) van de VU, en loopt parallel aan de cursus Praktijk 2. De cursus omvat verschillende onderdelen die in samenhang worden aangeboden: algemene didactiek (AD), vakdidactiek (VD) en peergroup (PG).

Aan het eind van de cursus heeft de student de nodige algemeen didactische en vakdidactische bagage aan te reiken die nodig is voor het handelen als docent op het niveau van een afgebakende onderwijs leerproces waarbij op basis van bestaande lesmaterialen wordt gewerkt. Hierbij wordt nadrukkelijk aangesloten bij de ontwikkelingsfase waarin de docent-in-opleiding (dio) zich bevindt (zie inhoud).

Inhoud vak

Didactiek 2 is geordend rondom een aantal voor het beroep van docent fundamentele kernpraktijken. Bij Didactiek 2 staan de volgende kernpraktijken centraal: (1) leerprocessen zichtbaar maken, (2) leerprocessen bevorderen, (3) leerprocessen toetsen, (4) communiceren en leiding geven, (5) leerlingen verantwoordelijkheid geven (van docentgestuurd naar leerlinggestuurd) en (6) aandacht geven aan verschillen. Ten opzichte van de cursus Didactiek 1 wordt de focus verlegd van de (individuele) les naar het leerproces van de leerling. De reikwijdte van het didactisch denken en handelen wordt daarmee ook groter: er wordt een begin gemaakt met het ontwerpen en uitvoeren van

reeksen van lessen.

De genoemde kernpraktijken komen expliciet aan de orde bij AD. Bij VD wordt aangesloten bij deze kernpraktijken en wordt de vertaalslag gemaakt naar het eigen (school)vak. Daarnaast worden bij VD belangrijke vakdidactische concepten en werkwijzen geïntroduceerd.

Bij PG staat wederom de eigen onderwijspraktijk van de dio centraal. Waar bij AD en VD de nadruk ligt op de rollen van de uitvoerende en ontwerpende docent en pedagoog, wordt bij PG nadrukkelijk vorm gegeven aan de rol van reflectieve onderzoekende professional. De samenhang tussen Didactiek 2 en Praktijk 2 komt onder andere tot stand doordat de dio en de werkplekbegeleider op school suggesties krijgen voor (observatie)opdrachten die kunnen bijdragen aan de ontwikkeling van de competenties die bij deze kernpraktijken horen. Alle inhoudscomponenten uit deze cursus worden tijdens de bijeenkomsten en in verwerking verbonden met de werkplekpraktijk van de student

In de laatste weken van de cursus is nadrukkelijker ruimte voor de eigen leervragen en behoefte van de student. Er worden keuzeworkshops aangeboden rondom uiteenlopende (vak)didactische thema's. Ook zijn er bijeenkomsten waarin dio's die veel moeite hebben met (o.a.) klassenmanagement extra coaching kunnen krijgen of extra aandacht verdienen op het gebied van bijvoorbeeld lesontwerp.

Onderwijsvorm

Alle onderwijs vindt plaats op de instituutsdag (maandag). Studenten zijn de hele dag aanwezig. In de ochtend is er een hoor/werkcollege AD, waarbij dio's van verschillende vakken samen zitten. De colleges AD worden steeds verzorgd door een tweetal docenten. In de middag is er een werkcollege VD onder begeleiding van de vakdidacticus. Deze colleges worden samen met dio's van hetzelfde vak in verschillende samenstellingen (homogeen en heterogeen) gevolgd.

Tenslotte zijn er, verspreid over de periode, drie PG bijeenkomsten, waarbij dio's van verschillende vakken in kleine groepen en onder begeleiding de eigen onderwijspraktijk onder de loep nemen en eventuele concerns daarbij bespreken.

Bij alle onderdelen (AD, VD en PG) wordt een actieve houding van de student gevraagd, zowel tijdens de bijeenkomsten daarbuiten. Regelmatig worden er verwerkingsopdrachten gegeven, waar individueel of in groepsverband aan wordt gewerkt. Deze opdrachten worden formatief geëvalueerd, onder andere door middel van (peer)feedback.

Toetsvorm

Didactiek 2 wordt afgesloten met een geschreven midi-proef waarin destudenten demonstreren dat zij een korte lessenreeks kunnen ontwerpen en (deels) uitvoeren en kunnen reflecteren op de manier waarop voorbereiding, uitvoer en afronding hebben plaatsgevonden. De proef bestaat uit een docentenhandleiding bij bestaand lesmateriaal, (incl. een globale planning, twee uitgewerkte lesontwerpen, verantwoording op basis van praktijk en theorie, en eigen leerdoelen bij deze les), een videocompilatie (15 min.) van de gegeven lessen en een terugblik op ontwerp en uitvoering. Bij het ontwerpen en uitvoeren van de les staan de kernpraktijken behandeld in de colleges algemene didactiek en vakdidactiek centraal (met een focus op de leerling en het leerproces). De terugblik op ontwerp en uitvoering vindt plaats aan de hand van de reflectiecirkel van Korthagen, de perspectieven van een docent als professional, ontwerper, uitvoerder, pedagoog en teamlid en de daarbij

behorende relevante theorie. De proef wordt beoordeeld aan de hand van een beoordelingsmodel gerelateerd aan de rubrics die voor elk van de docentperspectieven zijn geformuleerd voor fase 2.

Literatuur

Bij deze cursus worden de volgende algemeen didactische handboeken gebruikt:

- Ebbens, S. & Ettekoen, S. (2012). Effectief leren – basisboek. Groningen: Noordhoff Uitgevers B.V.
- Korthagen, F. & Lagerwerf, B. (2014). Een leraar van klasse. Den Haag: Boom Lemma Uitgevers
- Teitler, P. (2013). Lessen in orde. Bussum: Coutinho.
- Kohnstamm, R. (2014). Kleine ontwikkelingspsychologie: III de puberjaren. Houten: Bohn Stafleu van Loghum.

Daarnaast wordt veelvuldig gebruik gemaakt van relevante en actuele wetenschappelijke literatuur. Deze artikelen worden tijdens de cursus ter beschikking gesteld. De literatuur die bij VD gebruikt wordt is afhankelijk van het schoolvak waarvoor wordt opgeleid.

Overige informatie

Beheersing van de inhoud van het desbetreffende schoolvak wordt als voorkennis verondersteld.

Voorwaardelijk voor afronding van Didactiek 2: een voldoende beoordeling van Didactiek 1.

Didactiek 3

Vakcode	O_MLDIDAC_3 ()
Periode	Periode 1+2+3, Periode 4+5+6
Credits	9.0
Voertaal	Nederlands
Faculteit	Fac. der Gedrags- en Bewegingswetensch.
Coördinator	dr. B. de Vries
Examinator	dr. B. de Vries
Docent(en)	drs. J.K.W. Riksen, drs. H.R. Goudsmit, drs. Y.G. Meindersma, ir. E.J.F. Scheringa, drs. I. Pauw, drs. C.D.P. van Oeveren, drs. S. Donszelmann, drs. B. Klein, drs. W. Jongejan, dr. H.B. Westbroek, C.L. Geraedts, dr. A.A. Kaal, dr. A. Handelzalts, drs. K.L. Schaap, dr. B. de Vries, drs. A.J.C. Monquil, dr. J.G.M. van der Aalsvoort, drs. J.B. Penninx, W. Maas, F.L. de Vries MSc, drs. H. Stouthart, drs. E.D. van Noort, drs. N.H. Ypenburg, drs. J. Quartel
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	400

Doel vak

De cursus Didactiek 3 is onderdeel van de derde en laatste fase (fase III) van de Universitaire Lerarenopleiding (ULO) van de VU, en loopt parallel aan de cursussen Praktijk 3 en POO 2. De omvang van de cursus is een heel semester.

Aan het eind van de cursus heeft de student de verdiepende pedagogische, didactische en vakdidactische bagage aan te reiken die nodig is voor het

handelen als docent in complexe situaties. Hierbij wordt nadrukkelijk aangesloten bij de ontwikkelingsfase waarin de docent-in-opleiding (dio) zich bevindt (zie inhoud).

Inhoud vak

Het eerste blok van de cursus Didactiek 3 is weer geordend rondom een aantal voor het beroep van docent fundamentele kernpraktijken, namelijk: (1) differentiëren, (2) toetsen, (3) gedrags- en leerproblemen herkennen, (4) omgaan met gedrags- en leerproblemen, (5) mentor zijn en (6) een plek in de schoolorganisatie innemen.

De cursussen Didactiek 1 en 2 vormen samen het basisdeel van de Universitaire Lerarenopleiding (ULO); de cursus Didactiek 3 moet gezien worden als het verdiepingsdeel. In Didactiek 3 komen meer complexe thema's en kernpraktijken aan de orde. Het (vak)didactisch denken en handelen strekt zich nu ook uit over de lange termijn: er is bijvoorbeeld uitgebreid aandacht voor het vorm geven aan leerlijnen en het omgaan met gedrags- en leerproblemen. Ook wordt de dio nadrukkelijker uitgedaagd om een eigen visie op onderwijs vorm te geven en uit te dragen. Zo is de lesmethode niet langer leidend, maar wordt van dio's in toenemende mate verwacht zelf invulling te geven aan de inhoud en didactiek van de lessen (waarbij natuurlijk zowel bestaand als eigen materiaal kan worden gebruikt). Tenslotte zullen de (vak) didactische overwegingen die ten grondslag liggen aan de eigen visie onderbouwd moeten worden met behulp van relevante literatuur en eigen praktijkervaringen.

In het tweede blok van de cursus is er bij AD nadrukkelijk ruimte voordifferentiatie en de eigen leerbehoefte van de student. Er worden verschillende keuzemodules aangeboden rondom uiteenlopende algemeen didactische thema's, zoals de multiculturele school, zorg op school, omgaan met ordeproblemen en internationalisering. Studenten worden uitgenodigd om (voor een deel) zelf invulling te geven aan deze keuzeruimte.

Onderwijsvorm

Alle onderwijs vindt plaats op de instituutsdag (maandag). Studenten zijn de hele dag aanwezig. In de ochtend is er een hoor/werkcollege AD, waarbij dio's van verschillende vakken samen zitten. De colleges AD worden steeds verzorgd door een tweetal docenten. In de middag is er een werkcollege VD onder begeleiding van de vakdidacticus. Deze colleges worden samen met dio's van hetzelfde vak in verschillende samenstellingen (homogeen en heterogeen) gevolgd.

Tenslotte zijn er, verspreid over de periode, drie PG bijeenkomsten, waarbij dio's van verschillende vakken in kleine groepen en onder begeleiding de eigen onderwijspraktijk onder de loep nemen en eventuele concerns daarbij bespreken.

Bij alle onderdelen (AD, VD en PG) wordt een actieve houding van de student gevraagd, zowel tijdens de bijeenkomsten daarbuiten. Regelmatig worden er verwerkingsopdrachten gegeven, waar individueel of in groepsverband aan wordt gewerkt. Deze opdrachten worden formatief geëvalueerd, onder andere door middel van (peer)feedback.

Toetsvorm

Didactiek 3 wordt afgesloten met een geschreven meesterproef waarin de studenten demonstreren dat zij een volle lessenreeks kunnen ontwerpen en uitvoeren en kunnen reflecteren op de manier waarop voorbereiding, uitvoer en afronding hebben plaatsgevonden. De proef bestaat uit een lessenreeks met een coherente leerlijn en expliciet gemaakte

inhoudelijke en didactische keuzes. Het materiaal bevat: een lessenserie met een toets, een koppeling aan en neerslag van de (pedagogische) onderwijsvisie en visie op het vak van de student en de school, docentenhandleiding, leerlingmateriaal, evaluatie met collega's en leerlingen, een videocompilatie (15 min.) van de gegeven lessen en een terugblik op ontwerp en uitvoering. Bij het ontwerpen en uitvoeren van de les maakt de student een relevante selectie uit de kernpraktijken die tijdens de opleiding centraal hebben gestaan. De terugblik op ontwerp en uitvoering vindt plaats aan de hand van de reflectiecirkel van Korthagen, de perspectieven van een docent als professional, ontwerper, uitvoerder, pedagoog en teamlid en de daarbij behorende relevante theorie. Hierbij staat de student stil bij zijn/haar ontwikkeling op het gebied van deze rollen. De proef wordt beoordeeld aan de hand van een beoordelingsmodel gerelateerd aan de rubrics die voor elk van de docentperspectieven zijn geformuleerd voor fase 3 (een startbekwame docent).

Literatuur

Bij deze cursus worden de volgende algemeen didactische handboeken gebruikt:

- Ebbens, S. & Ettekoen, S. (2012). Effectief leren – basisboek. Groningen: Noordhoff Uitgevers B.V.
- Korthagen, F. & Lagerwerf, B. (2014). Een leraar van klasse. Den Haag: Boom Lemma Uitgevers
- Teitler, P. (2013). Lessen in orde. Bussum: Coutinho.
- Kohnstamm, R. (2014). Kleine ontwikkelingspsychologie: III de puberjaren. Houten: Bohn Stafleu van Loghum.

Daarnaast wordt veelvuldig gebruik gemaakt van relevante en actuele wetenschappelijke literatuur. Deze artikelen worden tijdens de cursus ter beschikking gesteld. De literatuur die bij VD gebruikt wordt is afhankelijk van het schoolvak waarvoor wordt opgeleid.

Overige informatie

Beheersing van de inhoud van het desbetreffende schoolvak wordt als voorkennis verondersteld.

Voorwaardelijk voor afronding van Didactiek 3: een voldoende beoordeling van Didactiek 2.

Disability and Development

Vakcode	AM_470588 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. R.M.H. Peters
Examinator	dr. R.M.H. Peters
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

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 could not be met without addressing the needs of people with disability has brought a new impetus to the field of disability and development. Another major 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 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 participatory methods,
- An introduction to community-based rehabilitation and disability inclusive development.

Onderwijsvorm

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

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

Toetsvorm

Participation in tutorial groups: 10%

Take-home examination, submitted electronically: 60%

Scientific article: 30%

For all parts a pass grade (> 5.5) needs to be obtained in order to receive a final mark.

Literatuur

See blackboard for suggested readings

Vereiste voorkennis

Bachelor-level education; any subject

Aanbevolen voorkennis

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.

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. Ruth Peters (r.m.h.peters@vu.nl)

Epidemiology

Vakcode	AM_1179 ()
Periode	Periode 3
Credits	3.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. R.M.H. Peters
Examinator	dr. R.M.H. Peters
Lesmethode(n)	Hoorcollege, Werkgroep, Computerpracticum
Niveau	500

Doel vak

- To be able to describe the strengths and weaknesses of traditional epidemiological study designs;
- To be able to understand, calculate, and apply measures of occurrence and association;
- To be able to understand and assess possible bias and effect modification;
- To gain an understanding of the principles of accuracy in epidemiology
- To acquire skills to interpret, describe, and present the outcomes of biostatistical analyses.
- To gain an understanding of the principles of screening and critically appraise its use in public health

Inhoud vak

The course consists of a theoretical, contextual, and practical component. The theoretical component is divided into two parts: the first part will focus on methodology (e.g. study-designs and bias), whereas the second part will emphasize applying statistical methods commonly used in epidemiology. You will primarily learn how to apply and interpret these methods in an epidemiological setting. We will focus less on the mathematical background (hence, we refer to this as 'applied biostatistics'). The contextual component will focus on past and current epidemiological developments, for instance the start of the HIV/AIDS pandemic. Lastly, the practical component will focus on applying all your new skills.

Onderwijsvorm

- Lectures (12 hours)
- Work groups (12 hours)
- Computer practicum (8 hours)
- Self-study (remaining time)

Toetsvorm

- Exam (100%)
- Assignment (insufficient/ sufficient)

Both elements need to be sufficient.

Literatuur

Available on blackboard

Doelgroep

This course is solely intended for students without a background in epidemiology (i.e. students who attended and completed another bachelor or master course in methodology and applied biostatistics, epidemiology and biostatistics, or similar, are strongly advised not to enroll in this course).

Intekenprocedure

n/a

Overige informatie

For more information contact Dr. Ruth Peters (r.m.h.peters@vu.nl)

Lecturers:

Ruth Peters

Maarten Kok

Ethics in Life Sciences

Vakcode	AM_470707 ()
Periode	Periode 3
Credits	3.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. J.T. de Cock Buning
Examinator	prof. dr. J.T. de Cock Buning
Docent(en)	prof. dr. J.T. de Cock Buning, dr. J.F.H. Kupper, P. Klaassen MA
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 and beyond

- To acquire conceptual knowledge of the central concepts in applied philosophy and professional ethics

- To be able to execute an ethical reflection on issues related to one owns life science

specialization and to open it for an impartial and constructive discussion

- To conduct, as a team based project, 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

. To show a respectful and accountable attitude in dealing with group dynamics during the work groups and project.

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 group training project, an ethical dialogue is prepared and executed in confrontation 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

- Moral dialogue: 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%)
 - written and verbal execution of the ethical dialogue (40%)
- All three elements have to be passed

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, Most of the work groups are in Dutch. Non Dutch speaking students will be placed in English work groups. All presentations and plenary discussions in English.

In order to maximize the experience of differences in values and preferences, and to 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. 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

Lectures 24 hrs (appr)
Outpatient clinics 12 hrs
Research tutorials 10 hrs (appr)

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.

From Molecule to Mind

Vakcode	AM_1190 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. G.J. Schenk
Examinator	dr. G.J. Schenk
Docent(en)	prof. dr. M. Verhage, prof. dr. A.B. Smit, dr. G.J. Schenk, prof. dr. J.J.G. Geurts
Lesmethode(n)	Deeltoets extra zaalcapaciteit, Hoorcollege, Practicum
Niveau	400

Doel vak

Providing master students, independent of primary training, with a solid basis in molecular and cell biology, neurophysiology and functional neuroanatomy.

Inhoud vak

The course will be used to brush up your knowledge of neurophysiology, molecular and cellular neurobiology and neuroanatomy. During the first day of the course (September 5th 2016) an entry test will be given to get an impression of your cell and molecular neurobiology knowledge level. This test cannot be failed. It is a diagnostic exam that is strictly meant to elucidate in which areas you are proficient and in which you need to improve. Keynote lectures by

established researchers on exciting and cutting-edge topics as well as a keynote symposium related to the different research programs on campus will be held to give you an impression of the research we do and to prepare you for your search for an internship position (which will start in February 2017). Throughout the course you will also receive training in critical thinking, since this is a skill that you will benefit from during the entire master (and beyond). The exam will consist of three parts: cell biology, neurophysiology and neuroanatomy.

Onderwijsvorm

Lectures, study groups, assignments, practical sessions, presentations, demonstrations.

Toetsvorm

You will have to prepare presentations based on neurophysiology and neuroanatomy related assignments and are expected to participate actively during practical sessions. A written examination with open end questions will consist of three parts: cell biology, neurophysiology and neuroanatomy, each accounting for a third of your final grade.

Literatuur

B. Alberts et al., 2013. Essential Cell Biology. Fourth Ed. ISBN 9780815344544.

D. Purves et al., 2012. Neuroscience. Fifth Ed. ISBN 9780878936953.
Practical guide : Human Neuroanatomy.
Macroscopic dissection of the brain, to be handed out during the first practical session.

Recent scientific papers/reviews, to be handed out during the course.

Vereiste voorkennis

A bachelor in Biology, Biomedical Sciences, Psychology with profile Biological Psychology or Neuropsychology, or similar pre-training.

Doelgroep

The vast majority (>70%) of graduates of the Master's programme in Neurosciences go on to join a PhD programme either at VU University Amsterdam or at another academic institute in the Netherlands or abroad. This course will provide you with a firm base in molecular biology, cell biology, neurophysiology and functional neuroanatomy, from which you will benefit for the rest of your scientific career.

Intekenprocedure

Please visit:

<http://www.vu.nl/nl/opleidingen/masteropleidingen/opleidingenoverzicht/m-o/neurosciences/admission-and-application/index.aspx>

For further information, please contact dr. Geert Schenk (g.schenk@vumc.nl)

Overige informatie

Past evaluations of the course have shown that the first weeks are very useful, but also very busy. Therefore, if you have some time to spare during the summer and you want to create some breathing room for yourself during the first weeks of the course, we suggest to read up before the start of the course. If you want to receive an overview of compulsory reading material or if you want any further information,

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)	dr. E.H. van der Zanden, dr. ir. J. van Vliet
Lesmethode(n)	Hoorcollege, Computerpracticum
Niveau	400

Doel vak

The overall aim of this course is to provide students with a working knowledge of spatial analysis applications in the context of health science research. Moreover, since spatial analysis can be useful for thesis projects, students are taught to conduct simple spatial analysis tasks independently in a research context.

Inhoud vak

The course provides an introduction to spatial analysis for health scientists, and discusses examples from several different application domains, such as health access and planning, risk analysis, disease mapping and modelling, and community profiling. At the end of the course, students:

1. Know the application domains of Health Geography and are able to identify them in concrete cases.
2. Have basic knowledge and understanding of GIS, spatial data, and spatial analysis.
3. Are able to analyze a simple health geographic problem independently, design a plan to solve it.
4. Are able to apply a GIS, spatial data, and spatial analysis to solve simple health geographic problems, and report on this by academic standards.
5. Are able to reflect on the methods and result of scientific papers in the field of health geography, as well as on the methods and results of their own spatial analysis.

Onderwijsvorm

18 hours of lectures and guest lectures,
30 hours of computer exercises,
16 hours of paper discussions (including preparation)
60 hours working on a final assignment (mapping Malaria),
32 hours of self-study
4 hours exam

Toetsvorm

The course is evaluated based on a written exam, that also includes practical exercises (50%), computer exercises (10%), group discussions of a scientific paper (10%), and the report based on the final assignment (30%)

Literatuur

Required reading:

- Wagtendonk and de Jeu (2013) Introduction to geographic information systems and spatial analysis.
- Nykiforuk and Flaman (2011) Geographic Information Systems (GIS) for health promotion and public health: A review

Further background reading will be made available during the course. All literature for this course will be made available through Blackboard.

Vereiste voorkennis

Students are expected to have a good knowledge of health sciences, but no prior knowledge of spatial analysis methods.

Doelgroep

Master Students in various health sciences and biomedical science and related fields.

Health, Globalisation and Human Rights

Vakcode	AM_470818 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	A. van Luijn MSc
Examinator	dr. C.W.M. Dedding
Docent(en)	prof. dr. P. Heutink
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: 12 hours

Group project, simulation and exam: 11 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 the 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)

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

- To expand knowledge on the whole range of immunological diseases, i.e. immunodeficiency, hypersensitivities, allergies, autoimmunity, (prevention of) infectious disease, graft rejection, graft versus host reactions and tumor immunology, with a focus on immunopathology.
- To train how to study immunological literature on selected immune disorders.
- To introduce critical research questions on 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 how they are disturbed in the diseases listed above.
- Point out diagnostic methodologies providing the most relevant information for diagnosis and selection and monitoring of therapeutic interventions.

Inhoud vak

Parham's 'The Immune System' (3rd ed.) will be used as a basis for lectures, with a focus on chapter 2,3 and 10-16. First, fundamental concepts in immunity and disease, essential for the built up of the course, will be discussed in the initial lecture. Subsequently, the chapters 2, 3, 10-16 of Parham (3rd ed.) covering diseases listed above, and specific research models are lectured. 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).

The course content (literature, lectures on chapters and lectures on research models) will be placed on Blackboard.

Onderwijsvorm

Lectures

Workinggroups on literature study

Independent study (approx. 128 hrs)

Toetsvorm

The course will be closed off with a written exam based on a combination of multiple choice (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 work groups.

Literatuur

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

Vereiste voorkennis

Solid knowledge on basic immunology, bachelor degree.

Aanbevolen voorkennis

The Immune System, Parham 3rd ed., chapter 1-9.

Doelgroep

MSc Biomedical Sciences - Specialization Immunology

Overige informatie

Partner coordinator: dr. Juan Garcia Vallejo

Facilitator in coordination: D. Claassen-Kramer

Docenten:

prof.dr. Bitter; dr. Bontkes; dr. Cillessen; prof.dr. van den Elsen; dr. Garcia Vallejo; dr. Gelderman; prof.dr. de Gruijl; dr. den Haan; dr. van Hoogstraten; dr. Hooijberg; dr. Pegtel; prof. dr. Rustemeyer; dr. van der Sar; dr. van der Pouw Kraan.

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

'International Comparative Analyses of Health Care Systems' 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
- pass/fail test 2 hours
- (project) self study remaining 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:

dr. Rob Baltussen, health economics at (UMCG)

Dr. Michael van den Berg (RIVM)

Barend Gerretsen (KIT)

Prof. dr. Wienke Boerma (NIVEL) It is recommended that students have knowledge on public policy in the context of healthcare.

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(s) 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 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

MSc Biomedical Sciences students

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 33 or 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
AM_1021, 3 EC, Microbial Genomics

Doelgroep

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 33 or 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. D.R. Essink
Examinator	dr. H.E. Brandt
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.

Before starting the placement, the student:

- 1) has passed Research Methods for Needs Assessments, and
- 2) has received an additional 12 ECs in the MSc programme (total at least 18 ECs).

For internships abroad generally an average grade of 7 or higher is

required.

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

Doelgroep

Students from the MSc Biomedical Sciences with a IPH specialization

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 33 or 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 Neurobiology

Vakcode	AM_1178 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
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 Neurobiology.

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 of period 1 of this specialization, and the student has acquired 18EC of the specialization specific courses.

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

Doelgroep

MSc Biomedical Sciences students

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 Biology 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 33 or 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 Psychophysiology

Vakcode	AM_471140 ()
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 Psychophysiology.

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_470715, 6EC, Functional Brain Imaging

AM_470736, 6EC, Psychophysiology

AM_1003, 6EC, Advanced Human Neurophysiology

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

Doelgroep

Students from the MSc Biomedical Sciences to specialize in Psychophysiology

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 33 or 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

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: 'Research Methods for Analyzing Complex Problems', 'Communication Organization and Management', and 'Analysis of Governmental Policy' (grade at least 6).

Doelgroep

Students Major Science in Society

Intekenprocedure

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

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

MSc Biomedical Sciences students

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.

Microbial Genomics

Vakcode	AM_1021 ()
Periode	Periode 3
Credits	3.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	prof. dr. R. Kort
Examinator	prof. dr. R. Kort
Lesmethode(n)	Hoorcollege
Niveau	500

Doel vak

1. After the lecture series the students obtained insight in:

- The historical development of microbiological sciences
- Techniques to explore the human microbiome
- Human – Microbe interactions in Health and Disease
- Metabolic strategies of microorganisms
- Interventions with probiotics, prebiotics and synbiotics

2. Students have gained experience on thinking and writing about the impact of microbes on either our environment, human health, or industrial applications.

Inhoud vak

During 10 lectures, the enormous diversity of microbial life will become evident. The lectures will include a number of ways to explore microbial life forms associated with our body, in particular related to health and disease. Applications of our knowledge on the human microbiota for diagnostics, prognostics and interventions will be discussed.

10 lectures (obligatory) including a 4-5 p. perspective

Onderwijsvorm

10 lectures (obligatory) including a 4-5 p. perspective

Toetsvorm

Each student will write a perspective (approximately 4-5 pages) for of one of the 10 lectures; the abstract will containing a 1 page summary of the lecture, and 3 pages on the relevance of the microbiological topic for society (with particular emphasis on human health). The selected lecture will be announced after the final lecture.

Literatuur

Selected papers:

Kort R, Caspers M, van de Graaf A, van Egmond W, Keijser B, Roeselers G. Shaping the oral microbiota through intimate kissing. *Microbiome*. 2014 Nov;2:41.

Budding AE, Grasman ME, Lin F, Bogaards JA, Soeltan-Kaersenhout DJ, Vandenbroucke-Grauls CM, van Bodegraven AA, Savelkoul PH. IS-pro: high-throughput molecular fingerprinting of the intestinal microbiota. *FASEB J*. 2010 Nov;24(11):4556-64

Borgdorff H, Tsvitvadze E, Verhelst R, Marzorati M, Jurriaans S, Ndayisaba GF, Schuren FH, van de Wijgert JH. Lactobacillus-dominated cervicovaginal microbiota associated with reduced HIV/STI prevalence and genital HIV viral load in African women. *ISME J*. 2014 Sep;8(9):1781-93.

Dutilh BE. Metagenomic ventures into outer sequence space. *Bacteriophage*. 2014 Dec 15;4(4):e979664.

Belzer C, Gerber GK, Roeselers G, Delaney M, DuBois A, Liu Q, Belavusava

V,
Yeliseyev V, Houseman A, Onderdonk A, Cavanaugh C, Bry L. Dynamics of
the
microbiota in response to host infection. PLoS One. 2014 Jul
11;9(7):e95534.

Vereiste voorkennis

Molecular Biology

Aanbevolen voorkennis

General and Molecular Microbiology

Doelgroep

MSc Students BioMolecular Sciences

Overige informatie

Venue: Artis de Volharding

<http://www.artis.nl/ontdek-artis/artis-a-z/monumenten-z/de-volharding/>

Announcement of lecture series:

<http://www.micropia.nl/nl/ontdek/verdiep-je-in-de-microbiologie/the-huma>

Lecture topics and speakers:

Microbiome in Health and Disease

Monday Jan 4 (10.00 – 12.00 u)

Prof. Remco Kort (TNO, VUA). Introduction into the human microbiome.

<https://www.linkedin.com/pub/remco-kort/14/547/403>

Dries Budding, MD (VUMC). Man and Microbe: a delicate superorganism

<https://www.linkedin.com/pub/dries-budding/5/956/78>

Tuesday Jan 5 (10.00 u – 12.00 u)

Dr. Douwe Molenaar (VUA). Dealing with big data of the microbiota.

http://www.ibi.vu.nl/sysbio/doku.php/people/douwe_molenaar

Dr. Evgeni Levin-Tsivtsivadze (TNO). Microbial ecology in health and
disease: a machine learning approach.

<http://www.learning-machines.com/>

Friday Jan 8 (10.00 u – 12.00 u)

Dr. Bas Dutilh (UU). Metagenomic ventures into outer sequence space.

<https://www.linkedin.com/in/dutilh>

Dr. Guus Roeselers (TNO). Microbial ecology of the gastro-intestinal
tract.

<https://www.linkedin.com/in/roeselers>

Monday Jan 11 (10.00 – 12.00)

Prof. Eddy Smid (WUR). The best foods are made by microbes.

<https://www.linkedin.com/pub/eddy-j-smid/9/338/9a8>

Prof Wilbert Bitter (VUMC) Die hard with a vengeance, strategy of
mycobacterial pathogens.

<http://www.aimms.vu.nl/en/people/b/bitter.aspx>

Tuesday Jan 12 (10.00 – 12.00)

Prof. Janneke van de Wijkert (University of Liverpool, Institute of
Infection and Global Health). Microbial ecology of bacterial vaginosis.

<https://www.linkedin.com/pub/janneke-van-de-wijkert/7/195/2a0>

Prof. Gregor Reid (Canadian Centre for Human Microbiome and Probiotic
Research, Lawson Health Research Institute). Fermented milk as a
delivery vehicle for probiotics in Africa.

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.R. van Dijk
Examinator	dr. M.R. van Dijk
Docent(en)	dr. M. Campos Ponce, 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 grant application on a selected parasite during an elevator pitch. At the end of this week students will have to prepare and 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 an written exam.

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 lecturesBasic cell biology and basic immunology

Peergroup fase 1

Vakcode	O_MLPEERGR_1 ()
Periode	Periode 1+2+3
Credits	0.0

Voertaal	Nederlands
Faculteit	Fac. der Gedrags- en Bewegingswetensch.
Coördinator	drs. I. Pauw
Examinator	dr. A. Handelzalts
Lesmethode(n)	Werkgroep
Niveau	400

Doel vak

In de peergroup staat de rol als 'professional' centraal. Studenten leren de regie te nemen over hun eigen leerproces en hun visie op onderwijs te beschrijven. Ze ontwikkelen een professionele identiteit, waarin ze de eisen die het beroep van docent aan ze stelt verbinden met eigen waarden en motieven. In peergroups reflecteren studenten op hun handelen in de praktijk, leiden daaruit ontwikkelpunten af, formuleren acties en evalueren deze. Verschillende instrumenten en methodes worden gebruikt (logboek, reflectiecirkel, intervisie, videoreflectie, etc.) om de student in staat te stellen de complexiteit van de onderwijspraktijk te doorgronden en hiervan te leren.

Peergroup Fase 2

Vakcode	O_MLPEERGR_2 ()
Periode	Periode 3+4+5
Credits	0.0
Voertaal	Nederlands
Faculteit	Fac. der Gedrags- en Bewegingswetensch.
Coördinator	dr. A. Handelzalts
Examinator	dr. A. Handelzalts
Lesmethode(n)	Werkgroep

Doel vak

In de peergroup staat de rol als 'professional' centraal. Studenten leren de regie te nemen over hun eigen leerproces en hun visie op onderwijs te beschrijven. Ze ontwikkelen een professionele identiteit, waarin ze de eisen die het beroep van docent aan ze stelt verbinden met eigen waarden en motieven. In peergroups reflecteren studenten op hun handelen in de praktijk, leiden daaruit ontwikkelpunten af, formuleren acties en evalueren deze. Verschillende instrumenten en methodes worden gebruikt (logboek, reflectiecirkel, intervisie, videoreflectie, etc.) om de student in staat te stellen de complexiteit van de onderwijspraktijk te doorgronden en hiervan te leren.

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 Maarten Kok (m.kok@vu.nl)

Policy, Politics and Participation

Vakcode	AM_470589 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	P. Klaassen MA
Examinator	P. Klaassen MA
Docent(en)	dr. J.F.H. Kupper, P. Klaassen MA, prof. dr. J.E.W. Broerse
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	500

Doel vak

- 1) To deepen your analytic skills with respect to the assessment of a specific societal problem;
- 2) To acquire further insight into the practice of interactive research;
- 3) To acquire further insights into specific methods and techniques of interactive research;
- 4) To practice skills in data collection and analysis;
- 5) To improve your argumentation skills;
- 6) To improve your communication skills;
- 7) To improve your skills in working effectively in a project team;
- 8) To deepen your knowledge of political theory and policy-making.

Inhoud vak

In this course you get the chance to gain experience in the practical implementation of methodologies for interactive research. In a four week policy project you will both improve your focus group research skills and deepen your understanding of the relevant theoretical concepts in the areas of policy studies, science and technology studies and democracy theory. In a group of about ten students you will participate in a real interactive research project which is executed at the Athena institute. In this project you will be trained in and practice various skills for data collection (such as focus group design and facilitation) and data analysis (such as qualitative content analysis). Specific attention is paid to your personal interactive research skills. At the end of the course, you prepare a policy report to present your findings. In an oral presentation your team will highlight the main results of your analysis and defend the recommendations you propose.

Onderwijsvorm

Lectures: 14 hours
 Training workshops: 4 hours
 Project assignment: 102 hours
 focus group execution: 6 hours
 Final presentations project results: 4 hours
 Self study: remaining 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.

Praktijk 1

Vakcode	O_MLPRAK_1 ()
Periode	Periode 1
Credits	6.0
Voertaal	Nederlands
Faculteit	Fac. der Gedrags- en Bewegingswetensch.
Coördinator	drs. Y.G. Meindersma
Examinator	drs. Y.G. Meindersma
Docent(en)	drs. J.K.W. Riksen, drs. H.R. Goudsmit, drs. Y.G. Meindersma, drs. I. Pauw, drs. C.D.P. van Oeveren, drs. S. Donszelmann, dr. H.B. Westbroek, C.L. Geraedts, dr. A.A. Kaal, dr. A. Handelzalts, drs. K.L. Schaap, drs. A.J.C. Monquill, dr. J.G.M. van der Aalsvoort, drs. J.B. Penninx, W. Maas, F.L. de Vries MSc, drs. H. Stouthart, drs. E.D. van Noort, drs. N.H. Ypenburg, drs. J. Quartel
Lesmethode(n)	Werkgroep
Niveau	400

Inhoud vak

Op de school wordt de aandacht op dezelfde kernpraktijken gericht als gedurende de instituutopleiding. De werkplekbegeleider is op de hoogte van de onderwerpen die op de instituutdag gebruikt worden en gebruikt dezelfde rubric als de instituutopleiders en vakdidactici om de vorderingen van de studenten te beoordelen.

Onderwijsvorm

Onder begeleiding van de werkplekbegeleider nemen de studenten steeds een groter en actiever aandeel in het lesgeven en werken in de school. Studenten met een baan (zij-instromers, onderwijstrainees etc) geven in dit stadium al zelfstandig les. Bij deze studenten is de nadruk bij de begeleiding vanuit de werkplekbegeleider op het niveau van didactische handelen in de les.

Toetsvorm

Op de school geven de studenten een presentatie over hun prestaties in de eerste acht weken. Dat doen ze aan de hand van de relevante rollen (vier van de vijf waarbij uitvoerder, ontwerper en pedagoog de meeste aandacht krijgen bij de reflectie op het lesgeven). De werkplekbegeleider gebruikt de rubric om het functioneren van de studenten in de klas te evalueren.

Praktijk 2

Vakcode	O_MLPRAK_2 ()
Periode	Periode 2+3
Credits	9.0
Voertaal	Nederlands
Faculteit	Fac. der Gedrags- en Bewegingswetensch.
Coördinator	dr. A. Handelzalts
Examinator	drs. Y.G. Meindersma
Docent(en)	drs. J.K.W. Riksen, drs. H.R. Goudsmit, drs. Y.G. Meindersma, ir. E.J.F. Scheringa, drs. C.D.P. van Oeveren, drs. S. Donszelmann, dr. H.B. Westbroek, C.L. Geraedts, dr. A.A. Kaal, dr. A. Handelzalts, drs. K.L. Schaap, drs. J.B. Penninx, W. Maas, F.L. de Vries MSc, drs. H. Stouthart, drs. J. Quartel
Lesmethode(n)	Werkgroep
Niveau	400

Inhoud vak

Tijdens de praktijkstage werken studenten aan het verder ontwikkelen van de kernpraktijken die in het instituutsdeel aan de orde zijn gekomen. Net als in fase 1 komt de verbinding tussen theorie en praktijk aan de orde. Op de werkplek wordt de aandacht op dezelfde vaardigheden gericht als tijdens de instituutopleiding. Dit betekent dat studenten, samen met hun werkplekbegeleider, gericht werken aan de verschillende thema's besproken in de (vak)didactiekcolleges van Didactiek 1 en 2.

Onderwijsvorm

Onder begeleiding van de werkplekbegeleider nemen de studenten steeds een groter en actiever aandeel in het lesgeven en werken in de school.

Toetsvorm

De praktijkbeoordeling wordt uitgevoerd door de vakdidacticus/instituutsopleider en de werkplekbegeleider aan de hand van het eerste lesbezoek en de ingevulde rubric.

Overige informatie

Voorwaardelijk voor afronding van Praktijk 2: een voldoende beoordeling van Praktijk 1 en Didactiek 1.

Praktijk 3

Vakcode	O_MLPRAK_3 ()
Periode	Periode 1+2+3, Periode 4+5+6
Credits	15.0
Voertaal	Nederlands
Faculteit	Fac. der Gedrags- en Bewegingswetensch.
Coördinator	drs. Y.G. Meindersma
Examinator	drs. Y.G. Meindersma
Docent(en)	drs. J.K.W. Riksen, drs. H.R. Goudsmit, drs. Y.G. Meindersma, drs. I. Pauw, drs. C.D.P. van Oeveren, drs. S. Donszelmann, dr. H.B. Westbroek, C.L. Geraedts, dr. A.A. Kaal, dr. A. Handelzalts, drs. K.L. Schaap, drs. A.J.C. Monquil, dr. J.G.M. van der Aalsvoort, drs. J.B. Penninx, W. Maas, F.L. de Vries MSc, drs. H. Stouthart, drs. E.D. van Noort, drs. N.H. Ypenburg, drs. J. Quartel
Niveau	400

Inhoud vak

In het verdiepingsdeel gaat de student meer en meer zelf(standig) lesgeven. De voorbereiding en evaluatie wordt samen met de werkplekbegeleider gedaan. Op de werkplek komen dezelfde onderwerpen aan de orde als in het instituut: vakdidactische verdieping van onderwijsconcepten en –strategieën, aandacht voor het afstemmen van onderwijs op de behoeften van individuele leerlingen, diversiteit en excellentie.

Op de werkplek wordt de aandacht op dezelfde vaardigheden gericht als tijdens de instituutsopleiding. Dit betekent dat studenten, samen met hun werkplekbegeleider, gericht werken aan de verschillende thema's besproken in de vakdidactiekdidactiek en de keuze modules. Het instituut biedt hiervoor concrete handreikingen aan in de vorm van een stageplan (gekoppeld aan de rubric).

Onderwijsvorm

Onder begeleiding van de werkplekbegeleider nemen de studenten steeds een groter en actiever aandeel in het lesgeven en werken in de school.

Toetsvorm

Voor de beoordeling van Praktijk 3 maakt de student in blok 6 een afspraak met zijn WPB en SO voor een afrondend lesbezoek. In overleg met de WPB en SO bepaalt de student welke klas hiervoor het meest geschikt is.

Na afloop van het lesbezoek bekijken WPB en SO met de student terug op de les. WPB en SO beoordelen de les aan de hand van de checklist (rubric).

Gecombineerd met het oordeel van vakdidacticus aan de hand van de tweede lesbezoek wordt een cijfer vastgesteld.

Overige informatie

Voorwaarden voor afronding van Praktijk 3: een voldoende beoordeling van Praktijk 2 en Didactiek 2.

Praktijk I

Vakcode	O_MLPRAKI ()
Periode	Ac. Jaar (september)
Credits	15.0
Voertaal	Nederlands
Faculteit	Fac. der Gedrags- en Bewegingswetensch.
Coördinator	ir. E.J.F. Scheringa
Examinator	ir. E.J.F. Scheringa
Niveau	500

Doel vak

De student maakt kennis met het onderwijs in de praktijk, verzorgt lessen en is betrokken bij andere leerlinggerichte activiteiten. Hij kan binnen de context van de school theoretische inzichten praktisch vormgeven en weet de praktijkomgeving te benutten om aan eigen ontwikkelpunten te werken.

De student werkt samen met anderen binnen en buiten de school en kan zijn functioneren als teamlid beschrijven en toelichten.

Inhoud vak

Het totale aantal klassencontacturen dat een student moet maken tijdens Praktijk 1 en 2, bedraagt tenminste 250. Tijdens deze uren observeert of verzorgt de student lessen en neemt deel aan andere leerlinggerichte activiteiten. Hij/zij geeft tenminste 120 lessen, waarvan minimaal 40 lesuren in de bovenbouw havo/vwo.

De verdeling en fasering van dit aantal uren over Praktijk 1 en 2 wordt in overleg met de begeleider op school bepaald. In Praktijk 1 ligt de nadruk op het observeren en het onder begeleiding voorbereiden, uitvoeren en evalueren van lessen.

Dit opleidingsonderdeel loopt parallel aan vakdidactiek 1 en algemene didactiek en pedagogiek 1, waardoor een goede wisselwerking mogelijk is tussen theorie en praktijk.

Toetsvorm

Praktijk 1 wordt door de schoolbegeleider beoordeeld aan de hand van een checklist. De schoolbegeleider doet daarbij een voorstel dat door de instituutsbegeleider moet worden onderschreven.

Vereiste voorkennis

Dit vak is alleen te volgen als onderdeel van de universitaire lerarenopleiding

Praktijk II

Vakcode	O_MLPRAKII ()
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Periode	Ac. Jaar (september)
Credits	15.0
Voertaal	Nederlands
Faculteit	Fac. der Gedrags- en Bewegingswetensch.
Coördinator	ir. E.J.F. Scheringa
Examinator	ir. E.J.F. Scheringa
Niveau	500

Doel vak

De student kan, als docent-in-opleiding, verantwoordelijkheid dragen voor het zelfstandig voorbereiden, uitvoeren en evalueren van lessen in de onder- en bovenbouw van het Havo/VWO. Hij kan tevens een bijdrage leveren aan schoolbrede activiteiten. Hij kan binnen de context van de school theoretische inzichten praktisch vormgeven en weet de praktijkomgeving te benutten om aan eigen ontwikkelpunten te werken. Hij kan reflecteren op opgedane ervaringen en verworven inzichten en deze op dusdanige manier beschrijven dat zij inzichtelijk worden voor anderen. De student toont zich professioneel in de samenwerking met anderen binnen en buiten de school en kan zijn functioneren als teamlid beschrijven en toelichten.

Inhoud vak

Het totale aantal klassencontacturen dat een student moet maken tijdens Praktijk 1 en 2, bedraagt tenminste 250. Tijdens deze uren observeert of verzorgt de student lessen en neemt deel aan andere leerlinggerichte activiteiten. Hij/zij geeft tenminste 120 lessen, waarvan minimaal 40 lessen in de bovenbouw havo/vwo.

De verdeling en fasering van dit aantal uren over Praktijk 1 en 2 wordt in overleg met de begeleider op school bepaald. Tijdens Praktijk 2 draagt de student verantwoordelijkheid voor een of meer klassen. Hij bereidt het onderwijs voor, voert het uit en evalueert het. Hij werkt hierbij nadrukkelijk samen met sectiegenoten en andere collega's binnen de school en is zich bewust van de context waarin zijn lessen plaatsvinden. In het portfolio doet hij verslag van zijn functioneren als teamlid en collega in de school.

Dit opleidingsonderdeel loopt parallel aan vakdidactiek 2 en algemene didactiek en pedagogiek 2, waardoor een goede wisselwerking mogelijk is tussen theorie en praktijk.

Toetsvorm

Praktijk 2 wordt door de schoolbegeleider beoordeeld aan de hand van een checklist waarop het eindcijfer voor de praktijk wordt gebaseerd. De schoolbegeleider doet daarbij een voorstel dat door de instituutsbegeleider moet worden onderschreven.

Tevens beoordeelt schoolbegeleider het functioneren van de student als teamlid en collega op basis van de door de student uitgevoerde portfolio-opdrachten.

Vereiste voorkennis

Dit vak is alleen te volgen als onderdeel van de universitaire lerarenopleiding.

Praktijkonderzoek 1

Vakcode	O_MLPROZ_1 ()
Periode	Periode 3
Credits	3.0
Voertaal	Nederlands
Faculteit	Fac. der Gedrags- en Bewegingswetensch.
Coördinator	dr. H.B. Westbroek
Examinator	dr. H.B. Westbroek
Docent(en)	drs. J.K.W. Riksen, drs. H.R. Goudsmit, drs. Y.G. Meindersma, ir. E.J.F. Scheringa, prof. dr. M. Meeter, drs. I. Pauw, drs. C.D.P. van Oeveren, drs. S. Donszelmann, drs. B. Klein, drs. W. Jongejan, drs. L.J. van Well-van Grootheest, dr. T. Bosma, dr. H.B. Westbroek, C.L. Geraedts, dr. J.M.H. Swennen, dr. A.A. Kaal, dr. A. Handelzalts, drs. K.L. Schaap, dr. B. de Vries, drs. A.J.C. Monquil, dr. J.G.M. van der Aalsvoort, drs. J.B. Penninx, W. Maas, F.L. de Vries MSc, drs. H. Stouthart, drs. E.D. van Noort, drs. N.H. Ypenburg, drs. J. Quartel
Lesmethode(n)	Werkgroep, Hoorcollege
Niveau	400

Doel vak

Tijdens het praktijkonderzoek vullen studenten de tijdens hun master opgedane onderzoeksvaardigheden aan met onderzoeksvaardigheden voor de eigen onderwijspraktijk.

Inhoud vak

In praktijkonderzoek 1 richt de opdracht zich primair op het leren herkennen, waarderen en gebruiken van verschillen type bronnen (praktijkbronnen, vakliteratuur en wetenschappelijke literatuur) om praktijkproblemen te analyseren en te duiden. Studenten verdiepen zich samen met hun collega's en begeleiders op school op een probleem uit de praktijk. Ze krijgen handvatten aangereikt om bronnen te zoeken en te beoordelen op relevantie en bruikbaarheid. Studenten werken op grond hiervan de praktische en theoretische context van het probleem uit.

Onderwijsvorm

De begeleiding vindt plaats op school (academische opleidingsschool) en op het instituut en bestaat uit de volgende vormen: colleges, werkcolleges, duo-begeleiding (VO docent/ULO docent).

Toetsvorm

Praktijkonderzoek 1 wordt afgesloten met een uitgewerkt praktijkprobleem. Onderzoeksvragen worden geformuleerd op basis van een probleemanalyse, en een verkenning van de praktische en theoretische context van het praktijkprobleem.

Literatuur

- Van der Donk, C., & Van Lanen, B. (2012). Praktijkonderzoek in de school. 2de druk. Coutinho, Bussum. ISBN 9789046903001
- Relevante en actuele artikelen over het onderzoeksonderwerp (via

blackboard en zelf verzamelen).

Overige informatie

Binnen Didactiek 1 en 2 hebben de studenten kennisgemaakt met het toepassen van relevante bronnen, waaronder onderzoeksartikelen, om praktijksituaties te duiden.

Praktijkonderzoek 2

Vakcode	O_MLPROZ_2 ()
Periode	Periode 1+2+3, Periode 4+5+6
Credits	6.0
Voertaal	Nederlands
Faculteit	Fac. der Gedrags- en Bewegingswetensch.
Coördinator	dr. H.B. Westbroek
Examinator	dr. H.B. Westbroek
Docent(en)	drs. J.K.W. Riksen, drs. H.R. Goudsmit, drs. Y.G. Meindersma, ir. E.J.F. Scheringa, prof. dr. M. Meeter, drs. I. Pauw, drs. C.D.P. van Oeveren, drs. S. Donszelmann, drs. B. Klein, drs. W. Jongejan, drs. L.J. van Well-van Grootheest, dr. T. Bosma, dr. H.B. Westbroek, C.L. Geraedts, dr. J.M.H. Swennen, dr. A.A. Kaal, dr. A. Handelzalts, drs. K.L. Schaap, dr. B. de Vries, drs. A.J.C. Monquil, dr. J.G.M. van der Aalsvoort, drs. J.B. Penninx, W. Maas, F.L. de Vries MSc, drs. H. Stouthart, drs. E.D. van Noort, drs. N.H. Ypenburg, drs. J. Quartel
Lesmethode(n)	Hoorcollege, Werkcollege
Niveau	400

Doel vak

Tijdens het praktijkonderzoek vullen studenten de tijdens hun master opgedane onderzoeksvaardigheden aan met onderzoeksvaardigheden voor de eigen onderwijspraktijk.

Inhoud vak

In Praktijkonderzoek 2 worden onderzoeksvragen uit de onderwijspraktijk vertaald in empirisch onderzoek. De student analyseert data uit de onderwijspraktijk om een antwoord te vinden op de onderzoeksvraag en rapporteert de bevindingen in een onderzoeksverslag en een presentatie aan de collega's in de school en aan mede-studenten op het instituut. Er wordt met name aandacht besteed aan de aard en doelen van praktijkonderzoek, en consequenties die dit heeft voor kwaliteitseisen en de betekenis van praktijkonderzoek voor de beroepspraktijk.

Onderwijsvorm

De begeleiding vindt plaats op school (academische opleidingsschool) en op het instituut en bestaat uit de volgende vormen: colleges, werkcolleges, duo-begeleiding (VO docent/ULO docent).

Toetsvorm

Praktijkonderzoek 2 wordt afgesloten met een verslag en een posterpresentatie over hun bevindingen en ze delen hun bevindingen zowel op het instituut als op school.

Literatuur

- Van der Donk, C., & Van Lanen, B. (2012). Praktijkonderzoek in de school. 2de druk. Coutinho, Bussum. ISBN 9789046903001
- Relevante en actuele artikelen over het onderzoeksonderwerp (via blackboard en zelf verzamelen).

Vereiste voorkennis

Vereiste voorkennis: Praktijkonderzoek 1 en onderzoekservaring op masterniveau in het eigen domeinvak.

Professionele ontwikkeling en onderzoek I

Vakcode	O_MLVPOOI ()
Periode	Ac. Jaar (september)
Credits	3.0
Voertaal	Nederlands
Faculteit	Fac. der Gedrags- en Bewegingswetensch.
Coördinator	dr. A. Handelzalts
Examinator	dr. A. Handelzalts
Docent(en)	drs. J.K.W. Riksen, drs. H.R. Goudsmit, drs. Y.G. Meindersma, drs. I. Pauw, drs. C.D.P. van Oeveren, drs. S. Donszelmann, drs. W. Jongejan, dr. H.B. Westbroek, C.L. Geraedts, prof. dr. J.J. Beishuizen, dr. A.A. Kaal, drs. K.L. Schaap, W. Maas, F.L. de Vries MSc, drs. H. Stouthart
Lesmethode(n)	Hoorcollege, Werkcollege
Niveau	500

Doel vak

De student kan systematische reflecteren op het eigen handelen in de onderwijspraktijk en daardoor richting geven aan de eigen professionele ontwikkeling.

De student kan een onderzoeksvraag formuleren voor een onderzoek aan zijn/haar eigen onderwijspraktijk, deze vraag inbedden in een theoretisch kader en een opzet maken voor de uitvoering van het onderzoek.

Inhoud vak

Dit vak bestaat uit twee delen: een reflectiedeel en een onderzoeksdeel. Het reflectiedeel krijgt vorm en inhoud in zogenaamde peergroepbijeenkomsten. Hierin reflecteert de studenten samen met anderen op zijn/haar handelen in de praktijk en leert daaruit ontwikkelpunten af te leiden, acties te formuleren en deze te evalueren. Verschillende instrumenten en methodes worden gebruikt (logboek, reflectiecirkel, intervisie,...) om de student in staat te stellen de complexiteit van de onderwijspraktijk te doorgronden en hiervan te leren. Daarnaast wordt een start gemaakt met het formuleren van de eigen visie op onderwijs en leren.

In het onderzoeksdeel wordt een opzet gemaakt van een praktijkonderzoek. In dit onderzoek diept de student één of meer vraagstukken uit de (eigen) onderwijspraktijk uit, waarbij een onderzoeksvraag ingebed wordt in een theoretisch kader en op één of enkele scholen empirisch materiaal wordt verzameld. In plenaire bijeenkomsten komen onderwerpen aan de orde als het formuleren van de probleemstelling en de onderzoeksvraag, het

verkennen van de literatuur en het verzamelen van de data. Daarnaast kan de student beroep doen op individuele begeleiding rondom zijn/haar onderzoek. Dit alles mondt uit in een eerste onderzoeksformat voor het praktijkonderzoek dat vervolgens in het vak Professionele Ontwikkeling en Onderzoek 2 uitgevoerd, gepresenteerd en geëvalueerd wordt.

Onderwijsvorm

colleges, werkgroepbijeenkomsten en individuele begeleiding van het onderzoek door instituutsbegeleiders.

Toetsvorm

Uitvoeren van opdrachten.

Literatuur

Een literatuurlijst wordt verstrekt aan het begin van de opleiding.

Vereiste voorkennis

Dit vak is alleen te volgen als onderdeel van de universitaire lerarenopleiding.

Overige informatie

Overgangsegeling met ingang van 31 augustus 2015:

Studenten die in september 2015 nog niet klaar zijn met het volgen van onderwijs van de eerste fase van het oude curriculum moeten voor het concrete onderwijs aanschuiven bij (een deel van) de colleges van het nieuwe curriculum. Dit wordt per geval besproken met de mentor.

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, students must have completed the 1st year.

Aanbevolen voorkennis

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

Doelgroep

Future employees of biomedical R&D departments in public institutions (e.g. University) or private (e.g. biotech) companies

Intekenprocedure

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.

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.

Reflective Practice Internship Science Communication

Vakcode	AM_1163 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	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). One of the two possible formats is the Reflective

Practice Internship (RPI). 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-based placement

Toetsvorm

Written report and oral presentation.

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 day-to-day supervision can be carried out by a trainee research assistant (AIO), postdoc or researcher.

Doelgroep

Students MSc Earth science year 2

Overige informatie

Participation in this compulsory component is only permitted if the student meets the relevant requirements for admission. These requirements are detailed in the Internship guidelines of Earth science (on

Blackboard) and in the Academic and Examination Regulations.

The work-based placement is subject to the FALW document: "Student placement (internship) and literature regulations". These regulations require detailed written agreements between supervisors and student that specify the conditions for the Master research project. This agreement should be sent for approval by the science communication co-ordinator at least two weeks before the planned start of the work-based placement.

If the proposal is of sufficient quality, you can start your internship.

If not, you'll need to adapt your proposal and send it for approval again. You can only start your internship after your research design has been approved.

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 Earth science Examination Board.

Information on Master internships is made available on Blackboard.

Research Internship Science Communication

Vakcode	AM_1162 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	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). One of the two possible formats is the full Research Internship. 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-based placement

Toetsvorm

Written report and oral presentation.

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 day-to-day supervision can be carried out by a trainee research assistant (AIO), postdoc or researcher.

Doelgroep

Students Earth science year 2

Overige informatie

Participation in this compulsory component is only permitted if the student meets the relevant requirements for admission. These requirements are detailed in the Internship guideline of science communication (on Blackboard) and in the Academic and Examination Regulations. The work-based placement is subject to the FALW document: "Student placement (internship) and literature regulations". These regulations require detailed written agreements between supervisors and student that specify the conditions for the Master research project. This agreement should be sent for approval by the science communication internship or master co-ordinator at least two weeks before the planned start of the work-based placement. If the proposal is of sufficient quality, you can start your internship. If not, you'll need to adapt your proposal and send it for approval again. You can only start your internship after your research design has been approved. 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 earth science Examination Board. Information on Master internships is made available on Blackboard.

Research methods for analyzing complex problems

Vakcode	AM_1182 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	A. van Luijn MSc
Examinator	A. van Luijn MSc
Lesmethode(n)	Hoorcollege, Werkcollege, Computerpracticum
Niveau	400

Doel vak

The objectives of this course are:

- To understand the differences between beta- and gamma research;
- To acquire insight in and understanding of a real world research process, including 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, their underlying theoretical concepts and their relative strengths and weaknesses;
- Being able to apply these various quantitative and qualitative research methods in a specific societal context;
- To interpret quantitative and qualitative findings;
- Being able to create an adequate research design for the investigation of a specific complex societal problem.

Inhoud vak

Contemporary societies increasingly face complex social problems, such as climate change, HIV/ AIDS or ethnic and religious diversity. These complex problems involve a variety of social actors: policy-makers, professionals, NGOs, industries, science and, of course, the public at large. Addressing these 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, including questionnaires, surveys, semi-structured interviews, and 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.

Onderwijsvorm

Research Methods for Analyzing Complex Problems is a parttime course of eight weeks (6 ECTS). The total study time is 160 hours. Tuition methods include lectures, workgroups, workshops, group project work and self-study.

The different elements have the following study time:

- lectures 20 hours
- workgroups and training 36 hours
- examination 3 hours
- project work & reading (self-study) Remaining hours

Please note that attendance to the workgroup sessions is compulsory. If you miss one workgroup, with a good reason, you will receive an additional assignment. If you miss more than one workgroup session it is no longer possible to pass the project part of the course.

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

The course grade is based on the group assignment 'research design' and the exam. Both aspects need to be graded 6.0 or higher.

Exam 50% of total grade

Group assignment 'research design' 50% of total grade

Literatuur

The literature of this course consists of selected scientific articles that are provided on blackboard, and the books:

- 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, United Kingdom. ISBN 978-1-4462-6019-7

An overview of the literature per lecture will be provided on blackboard.

Doelgroep

The course 'Research Methods for Analyzing Complex Problems' is a compulsory course for first year master students 'Management, Policy Analysis and Entrepreneurship in Health and Life Sciences'. This course is also a compulsory course within the Science communication- and Societal differentiations of Health, Life and Natural Sciences Master programmes. It is an optional course for other Life Sciences Master program students at the VU University.

Intekenprocedure

VUnet

Overige informatie

Lectures are in English, part of the workgroups are in Dutch. The assignments are written in English.

Please note that attendance to the workgroup sessions is compulsory. If you miss one workgroup, with a good reason, you will receive an additional assignment. If you miss more than one workgroup session it is no longer possible to pass the project part of the course.

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.

Lecturer:
dr. M.E. Arentshorst

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
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.

Rhythms of the Brain

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. K. Linkenkaer Hansen
Lesmethode(n)	Hoorcollege, Werkgroep, Computerpracticum, Practicum
Niveau	600

Doel vak

Note, the course has changed name to "Rhythms of the Brain" to reflect the focus on measuring, analyzing and interpreting neuronal oscillations.

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

1. Explain how the human brain generates scalp electroencephalographic (EEG) signals, both ongoing oscillations and event-related potentials (ERPs).
2. Acquire practical experience with EEG (i.e., measure EEG, perform quantitative and statistical analysis to draw conclusions about the relation between brain activity and cognition/behavior, and present the results on a poster).
3. Explain key concepts of complex-systems science that have gained acceptance in the cognitive and behavioral neurosciences.
4. Apply state-of-the-art complexity-analysis techniques to EEG data and perceptual/behavioral time series, and
5. ...understand how these techniques can be applied in fundamental science and applied medical fields, e.g., for clinical trials and personalized medicine.
6. Explain the advanced techniques that estimate brain sources from the EEG signals, and outline the possibilities and limitations based on own experiences.
7. Explain the rationale of so-called "integrated biomarkers", use specialized toolboxes to compute them and critically reflect on the pros and cons of this approach to functionally assess the state of a human brain based on the rhythms that it generates.

Inhoud vak

Understanding the complexity of the human brain and mind is one of the greatest scientific challenges of the 21st century. To address these challenges, researchers increasingly adopt theories and methods used to study complexity in other natural systems. In this course, we give you a solid conceptual understanding of "complexity" and tools to study the complexity of the human brain through quantitative analysis of the brain rhythms that it generates and the variability in cognitive and behavioral tasks.

We consider it critical that students gain an in-depth understanding of the analytical tools in order to properly use and interpret the outcome of the different analysis techniques. This is achieved by covering the theory in the lectures followed by tutorials in the computer rooms. The concepts of "critical dynamics" and power-law scaling behavior are carefully explained in the context of time-series analysis tools, generating mechanisms, and functional implications. Key concepts of complex networks and analytical tools to characterize them based on M/EEG data are also covered.

Another important component of the course is to teach you how to perform high-density EEG recordings of spontaneous brain activity during resting-state conditions and cognitive tasks and to analyze these signals with classical as well as modern complexity algorithms. You will work in small groups to record, analyze and present both data on EEG and

its cognitive/behavioral correlates at the end of the course. Finally, 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 in the context of normal variation in biomarkers and the associated challenges in objective diagnosis, prognosis, and treatment selection. We explain how data-mining and -classification techniques from artificial intelligence can be used to integrate information from multiple biomarker algorithms to increase the accuracy of clinically relevant functional assessments. While the course is focused on understanding variability in human cognition and behavior in health and disease, the concepts and tools equally apply to research on common animal models.

Onderwijsvorm

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

Activity Hours of study

Lectures (l) 20

Self study (literature and lecture sheets) 38

Practicals in EEG lab (Prac) 8

Computer practicals and project assignment (A) 36

Journal club (Pres) 8

Poster preparation (A) 18

Preparation for exams (poster and written) 40

Total 168

Toetsvorm

Analysis and making research poster (R, 15%)

Presentation of research poster (Pres, 25%)

Written examination (E: 60%)

Compensation is not possible for any of these assessments.

Literatuur

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.

Annotated sheets from lectures

Doelgroep

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

Overige informatie

dr. K. Linkenkaer Hansen with guest lectures of dr. D.J.A. Smit

Science and Communication

Vakcode	AM_470587 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	P. Klaassen MA
Examinator	P. Klaassen MA
Docent(en)	dr. J.F.H. Kupper, drs. ir. M.G. van der Meij, P. Klaassen MA
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	500

Doel vak

- a) Gain theoretical insight in the nature of science,
- b) Gain theoretical insight in the nature of communication,
- c) Gain theoretical insight in the relationship between science and society,
- d) Gain insight in the role of science communication in this relationship,
- e) Acquire knowledge of different theories and models of science communication,
- f) Acquire knowledge of different strategies, media and activities for science communication,
- g) Learn how to practically apply theoretical concepts from the field of science communication in communicating science,
- h) Develop practical skills for science communication (especially writing and giving oral presentations).

Inhoud vak

Science is all around us and shapes our lives in many different ways. From the vaccines you need to get when traveling abroad to the smartphone you use on a daily basis, and from the public transportation you use to get to the university to the ingredients of your toothpaste: scientific knowledge is elemental to all of these. Simultaneously, society shapes the ways in which science and technology develop too. Science, technology and society influence each other continuously—or, to put it differently, they 'communicate'.

Students of the Science Communication specialization are expected to become experts in understanding and designing interactions between science and society. In order to make this interaction fruitful and valuable for both science and society, it is first of all important to gain theoretical knowledge about science, about communication and about science communication. Science and Communication provides students with the theoretical and conceptual foundations of the discipline of science communication. Thus, you will develop an in-depth understanding of communication processes at the core of several interfaces, including those between scientists from different disciplines, between different sciences and their stakeholders, and between science and the public.

Onderwijsvorm

Lectures (18 h)

Workgroups (15 h)

Home-study for group assignments (12h)

Home-study for individual assignments/exam (100h)

Toetsvorm

• Your participation, two (small) individual assignments (1A & 1B) a pitch presentation and a "job application". All these are assessed as pass or fail.

If you pass all of them, you have earned the first 10% of your final mark. For each one you fail, you have to do an alternative assignment that has to be handed in on Friday October 22nd. Nota bene: if you fail your participation, this cannot be compensated with an alternative assignment!

• A group assignment in which you develop a label to an exhibit at a science museum and write an accompanying essay. 10%

• A review of a science communication effort of your own choosing (an exhibit at a science center or museum, a public lecture, a (popular) science book, et cetera...). 10%

• "TED-talk" in which you present the research you did (e.g. for your Bsc thesis or (first) Msc internship). 20%

• Exam. 50%

Literatuur

Academic articles. Direct links to articles will be provided on BlackBoard.

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, Werkcollege
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 science and technology studies 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), Dialogue presentations (12h), Selfstudy (remaining hours)

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
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
- science reporting using videos
- 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, popular science videos, 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 (remaining hours).

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, Werkcollege, Veldwerk
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 development of exhibit experience and content design.
- 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

Workgroups

Workshops

Home-study for group assignments

Home-study for individual assignments

Field work

Toetsvorm

Group assignments (45%), final presentation (15%), and individual assessment(s) (40%). For all assignments and assessments 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

It is possible to follow the course as an elective course outside of one of the science communication master specialisations of FALW/FEW. In that case additional reading may be required depending on the student's background.

Doelgroep

Optional course in the Science Communication master specialisation 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. Additional reading may be required.

Overige informatie

Guest lectures from and excursions to for instance Artis, NEMO, Naturalis, NorthernLight, Museon, etc.

Scientific Writing in Engl (AM_BMED)

Vakcode	AM_1161B ()
Periode	Periode 3+4+5+6
Credits	3.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	M. van den Hoorn
Examinator	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, Discussion)

Students get a pass mark for all writing assignments;

Students provide elaborate peer feedback (Introduction, Methods, Discussion, Abstract);

Students attend at least 7 out of 8 sessions;

Students are well prepared for each session (i.e. do all homework assignments);

Students participate actively in class;

Students do not plagiarise or self-plagiarise.

Writing assignments:

1. If students have a BSc thesis in a traditional thesis form (e.g., 20+ pages) and written in English, they may use this for the writing assignments.
2. If students have a BSc thesis in a traditional form (e.g., 20+ pages) written in another language than English, they may use this for the writing assignments.
3. If students have written a paper or report in English that's not already in article form, they may use this for the writing assignment.
4. If students are working on their MSc thesis or internship report when taking Scientific Writing in English, they may use this for the writing assignments. They will have to notify their supervisor to make sure that they won't be accused of self-plagiarism.
5. If students cannot or do not wish to use any of the above-mentioned texts for the writing assignments (1-4), they are expected to do a limited Literature Review on a topic in their field of research, using at least 5 articles.

Students are not allowed to use the following texts for the writing assignments:

1. A BSc thesis written in English that's already in article form.
2. A MSc thesis written in English that's already in article form (and that has already been marked).
3. An internship report written in English that's already in article form (and that has already been marked).
4. A paper or report written in English that's already in article form.

Literatuur

Effective Scientific Writing: An Advanced Learner's guide to Better English, 4th edition (February 2016) (A. Bolt & W. Bruins, ISBN 978 90 8659 617 1). VU bookstore: €27.95.

Vereiste voorkennis

In order to start this course the student is required to already have found an internship which has been approved and administered.

Doelgroep

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

Intekenprocedure

Important: each group has a minimum of 18 and maximum of 24 participants, so students should register on time through VUnet to ensure a place in one of the (designated) groups. If you have registered for a group in VUnet, you are expected to attend all sessions (eight). If you decide to withdraw from the course, please do so in time. This all will avoid a 'fail' on your grade list for not taking part in this course and allows other students to fill in a possible very wanted group spot.

Each semester, one or more open/general groups also take place (with a minimum of 18 participants), for which students may register instead of the designated group for their master programme. Students are advised to consult their schedule carefully, since overlap may occur. For more information, please check course code AM_471023.

Overige informatie

- To do well, students are expected to attend all lessons. Group schedules are to be found at rooster.vu.nl and on Blackboard.
- A VUnet registration for this course automatically gives access to the corresponding Blackboard site. Group registration only takes place via Blackboard (general groups: registration by students following FALW programmes offering this course; groups assigned to specific studies: registration through programme and course coordinator).
- Make sure Scientific Writing in English does not overlap with another course.
- If you have registered for a group in Blackboard, you are expected to attend all sessions (eight). If you decide to withdraw from the course, do so in time in VUnet. This will avoid a 'fail' on your grade list for not taking part in this course and allows other students to fill in a possible very wanted group spot.
- For specific Blackboard matters concerning this course, please contact blackboard.beta@vu.nl.
- Full time students with their main registration at VU will be given preferential treatment for placement in this course. For secondary students proof of enrollment is not a guarantee of placement.

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. A. Abdellaoui MSc
Lesmethode(n)	Hoorcollege, Computerpracticum

Doel vak

Provide practical skills for genetic linkage and association studies to analyse neurological disorders.

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 about linkage and GWAS (75%)

Written homework Assignment GWAS (25%)

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

Basic knowledge of statistics, variance component analysis (Anova), Regression analysis, and Mendelian genetics.

Aanbevolen voorkennis

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

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