



Physics and Astronomy MSc

Vrije Universiteit Amsterdam - Faculteit der Exacte Wetenschappen - M Physics - 2016-2017

Structure of the training

In the Master curriculum knowledge of physics in general and in one or more specific areas of physics is deepened. The global structure is:

Part	O	M,C,E
Courses within specialisation	36	24
Seminar, literature study or project	6	
Research project	54	30
Presentation and Master thesis	6	6
Optional, deficiencies	12	
M, C, E courses or academic skills	6	60
Total	120	120

The programme includes compulsory courses for the chosen specialisation and optional courses that can be chosen from a list. In some specializations there are no optional courses in the M.C ,E-variants.

Furthermore, a student in the research variant can participate in a project or student seminar or can write an essay on a subject not directly related to his field of specialisation. 12 cp can be freely chosen within the university from courses on a 2nd or higher year level.

Research variant

The research variant is meant for students who want to pursue a research career. Students who have chosen to follow this variant will spend most of their time on courses and on their research project, including the Master's thesis in the chosen specialisation. Generally spoken these students may aim at continuing their study with PhD education, in order to obtain an executive job as researcher, group leader, at a university, research institution, government or (industrial) company.

The possible specialisations (research variants) are:

- Particle and Astroparticle Physics
- Theoretical Physics
- Advanced Matter and Energy Physics
- Laser Sciences and Biomolecular Photonics
- Physics of Life and Health

All programmes are together with the UvA. In some specialisations there is also cooperation with Chemistry and with the section Physics and Medical Technology of the VU medical centre.

M, C en E variant

Furthermore, a choice can be made out of three study variants.

- Communication variant (C-variant)
- Education variant (E-variant)

- Society oriented variant (M-variant)

For students wishing to combine a sound background in physics with applications or management in industry or business, the study variant Physics and Business (M) is offered. In the same spirit the Communication and Education programme lines prepare for careers in, e.g., science policy, scientific reporting and publishing, and science education in various settings (schools, museums, educational software). Apart from coursework the curriculum for the Business and Communication and Education lines also includes an internship outside the university, e.g., in a company, government agency, school or museum.

Deficiencies

The examination committee can require that a student follows courses from the Bachelor programme Physics in order to make up for deficiencies, up to a maximum of 12 cp.

Students following the O variant are required to spend 6 cp on an M/C/E subject, or on academic skills, so as to broaden their education. Students who have chosen an M, C or E variant can spend a maximum of 60 cp on subjects within that study variant.

[To master co-ordinators](#)

Physics and Astronomy (joint degree): XM_PA_JD: 51211035

The curriculum in this Master's programme mainly takes place at the University of Amsterdam. For in-depth information about the structure and the courses, please visit the [website of the University of Amsterdam](#).

The specialization Science, Business and Innovation mainly takes place at the Vrije Universiteit Amsterdam. More information about the structure and the courses can be found below.

Inhoudsopgave

Specialization Science, Business & Innovation	1
Compulsory Choice 1 out of 2	1
Compulsory Choice of 12 ec	2
Compulsory Choice of 24 EC	2
Recommended optional Courses	3
Compulsory Courses	3
Communication variant	3
Courses for Communication Part	4
Optional courses: select at least 12EC	4
Internship communication	4
Compulsory Courses	4
Educatie variant	5
Master Leraar VHO Natuurkunde, vanaf 2015	5
LVHO Natuurkunde, overgangsregeling	6
Research Variant Particle Physics and Astroparticle Physics	6
Optional courses (24 ec compulsory)	7
M, C, E Courses or academic Skills (6 ec)	8
Compulsory Courses	8
Expired Courses PPAP	8
Research Variant Theoretical Physics	8
M, C, E Courses or academic Skills (6 ec)	9
Optional courses (24 ec compulsory)	9
Recommended elective courses	10
Compulsory Courses	10
Expired Courses TP	10
Research Variant Advanced Matter and Energy Physics	11
Compulsory Choice Master Project	11
Minor Project Choice	12
M, C, E courses or academic Skills (3 ec)	12
Optional courses (12 ec compulsory)	13
Compulsory Choice (6 ec)	13
Compulsory Courses	14
Expired Courses AMEP	14
Research Variant Physics of Life and Health	14
Compulsory Choice Master Project	15
Compulsory Choice Minor Project	15
Optional courses (12 ec compulsory)	16
Compulsory Choice (12 ec)	16
M, C, E courses or academic Skills (6 ec)	16
Compulsory Courses	17
Expired Courses PLH	17
Specialization Science for Energy and Sustainability	17
Compulsory Choice of at least 24 ec.	18

Compulsory Choice Ethics and Portfolio Academic skills	18
Compulsory Choice Master Project	19
Minor Project Choice	19
Compulsory Courses	19
Society Oriented Variant for Natural and Life Sciences	20
Courses for Society Oriented Part	20
MSc Biology Science in Society specialisation	20
Compulsory courses	21
Compulsory choice of at least 6 EC	21
Vak: Advanced 3D and 4D Medical Imaging (Periode 5)	21
Vak: Advanced Medical Image Processing (Periode 2)	22
Vak: Advanced Medical Technology (Periode 5)	23
Vak: Advanced MRI (Periode 6)	23
Vak: Advanced Spectroscopy (Periode 6)	23
Vak: Analysis of Governmental Policy (Periode 1)	24
Vak: Astroparticle Physics (Periode 4)	26
Vak: Beyond the Standard Model (Periode 5)	26
Vak: Biomedical Modelling and Simulation (Periode 1)	26
Vak: BioSolar Cells (Periode 1)	28
Vak: Business & Innovation Project (Ac. Jaar (september))	28
Vak: Business Management in Health and Life Sciences (Periode 2)	29
Vak: Business, Innovation and Value Creation in the Life Science Industry (Periode 3)	30
Vak: Catalysis for sustainable energy (Periode 4)	32
Vak: CERN Research Project (Periode 6)	32
Vak: CERN Summer Student Lecture Programme (Zomerperiode)	33
Vak: Chemical Biology (Periode 1)	33
Vak: Clinical Development and Clinical Trials (Periode 3)	35
Vak: Communication, Organization and Management (Periode 2)	36
Vak: Computational Methods (Periode 4)	37
Vak: Current Sustainable Energy Technologies (Periode 3)	38
Vak: Didactiek 1 (Periode 1)	38
Vak: Didactiek 2 (Periode 2+3)	40
Vak: Didactiek 3 (Periode 1+2+3, Periode 4+5+6)	43
Vak: Disability and Development (Periode 2)	45
Vak: Dynamics of Biomolecules and Cells (Periode 4)	47
Vak: Emergent Energy Materials (Periode 1)	48
Vak: Energy and Climate Change; Science, Policy and Economics (Periode 2)	48
Vak: English Academic Course (Periode 2+3, Periode 5+6)	49
Vak: Entrepreneurship for Physicists (Periode 3)	49
Vak: Environmental Chemistry (Periode 1)	50
Vak: Epidemiology (Periode 3)	51
Vak: Ethics in Biomedical Research (Periode 3)	52
Vak: Ethics in Life Sciences (Periode 3)	53
Vak: Fermi Quantum Gases (Periode 5)	55
Vak: From Genome to Physiome (Periode 6)	55

Vak: General Relativity (Periode 4)	56
Vak: Gravitational Waves (Selected Topics in Gravitation and Cosmology) (Periode 5)	56
Vak: Green Chemistry (Periode 1)	57
Vak: Health, Globalisation and Human Rights (Periode 2)	57
Vak: Homogeneous Catalysis (Periode 5)	58
Vak: Hydrodynamics (Periode 4)	59
Vak: Innovation in Medical Technology to Improve the Health Care System (Periode 6)	59
Vak: Internship Science in Society (Ac. Jaar (september))	60
Vak: Laboratory challenge (Periode 6)	61
Vak: Light-tissue interaction (Periode 1)	62
Vak: Literature Study mPhys-PLH (Ac. Jaar (september))	63
Vak: Management of Sustainable Innovation (Periode 2)	63
Vak: Managing Science and Technology in Society (Periode 1)	64
Vak: Master Project Particle Physics and Astroparticle Physics (Ac. Jaar (september))	65
Vak: Master Project Physics: AMEP (Ac. Jaar (september))	66
Vak: Master Project Physics: AMEP (Ac. Jaar (september))	66
Vak: Master Project Physics: AMEP (Ac. Jaar (september))	66
Vak: Master Project Physics: AMEP (Ac. Jaar (september))	66
Vak: Master Project Physics: AMEP (Ac. Jaar (september))	67
Vak: Master Project Physics: PLH (Ac. Jaar (september))	67
Vak: Master Project Physics: PLH (Ac. Jaar (september))	67
Vak: Master Project Physics: PLH (Ac. Jaar (september))	67
Vak: Master Project Physics: PLH (Ac. Jaar (september))	68
Vak: Master Project Physics: PLH (Ac. Jaar (september))	68
Vak: Master Project SfES (Ac. Jaar (september))	68
Vak: Master Project SfES (Ac. Jaar (september))	68
Vak: Master Project SfES (Ac. Jaar (september))	69
Vak: Master Project SfES (Ac. Jaar (september))	69
Vak: Master Project SfES (Ac. Jaar (september))	69
Vak: Master Project Theoretical Physics (Ac. Jaar (september))	69
Vak: Materials for energy and environmental sustainability (Periode 4+5)	70
Vak: Mathematica for Physicists (Periode 3)	70
Vak: Mathematical Methods (Periode 4)	71
Vak: Mathematical Methods in Theoretical Physics 1 (Periode 1)	71
Vak: Mathematical Methods in Theoretical Physics 2 (Periode 2)	72
Vak: Minor Project Physics: AMEP (Ac. Jaar (september))	72
Vak: Minor Project Physics: AMEP (Ac. Jaar (september))	72
Vak: Minor Project Physics: AMEP (Ac. Jaar (september))	73
Vak: Minor Project Physics: AMEP (Ac. Jaar (september))	73
Vak: Minor Project Physics: PLH (Ac. Jaar (september))	73
Vak: Minor Project Physics: PLH (Ac. Jaar (september))	73
Vak: Minor Project Physics: PLH (Ac. Jaar (september))	74
Vak: Minor Project Physics: PLH (Ac. Jaar (september))	74
Vak: Minor Project Physics: SfES (Ac. Jaar (september))	74
Vak: Minor Project Physics: SfES (Ac. Jaar (september))	74

Vak: Minor Project Physics: SfES (Ac. Jaar (september))	75
Vak: Minor Project Physics: SfES (Ac. Jaar (september))	75
Vak: Nanophotonics (Periode 6)	75
Vak: Networked Organizations and Communication (Periode 2)	76
Vak: NIKHEF Project (Periode 5)	76
Vak: Open Innovation in Science and Sustainability (Periode 2)	77
Vak: Organic Photovoltaics (Periode 5)	77
Vak: Parameter Estimation Applied to Medical and Biological Sciences (Periode 4)	78
Vak: Particle Cosmology (Periode 2)	79
Vak: Particle Detection (Periode 2)	79
Vak: Particle Physics I (Periode 1)	80
Vak: Particle Physics II (Periode 2)	80
Vak: Particles and Fields (Periode 4+5)	80
Vak: Peergroup fase 1 (Periode 1+2+3)	81
Vak: Peergroup Fase 2 (Periode 3+4+5)	81
Vak: Photosynthesis and Energy (Periode 5)	82
Vak: Photovoltaics (Periode 4)	82
Vak: Physics of Organs 2: Sensory Organs and Bioelectricity (Periode 2)	83
Vak: Policy, Politics and Participation (Periode 2)	83
Vak: Praktijk 1 (Periode 1)	84
Vak: Praktijk 2 (Periode 2+3)	85
Vak: Praktijk 3 (Periode 1+2+3, Periode 4+5+6)	86
Vak: Praktijk I (Ac. Jaar (september))	87
Vak: Praktijk II (Ac. Jaar (september))	88
Vak: Praktijkonderzoek 1 (Periode 3)	89
Vak: Praktijkonderzoek 2 (Periode 1+2+3, Periode 4+5+6)	90
Vak: Principles of Pharmaceutical Sciences / Pharmacochimistry (Periode 1)	91
Vak: Professionele ontwikkeling en onderzoek I (Ac. Jaar (september))	92
Vak: Programming C++ (Periode 3)	93
Vak: Project Sustainable Future (Periode 6)	94
Vak: Protein Science (Periode 1)	94
Vak: Quantum Field Theory (Periode 2)	95
Vak: Quantum Field Theory - Extension (Periode 3)	96
Vak: Quantum optics (Periode 2)	96
Vak: Reflective Practice Internship Science Communication (Ac. Jaar (september))	96
Vak: Research Internship Science Communication (Ac. Jaar (september))	98
Vak: Research methods for analyzing complex problems (Periode 1)	99
Vak: Researching science research (Periode 4+5)	101
Vak: SBI Project & Master Thesis (Ac. Jaar (september))	102
Vak: SBI Research Methodology (Periode 1)	103
Vak: Science and Communication (Periode 1)	104
Vak: Science and Society in Historical Perspective (Periode 4+5)	106
Vak: Science in Dialogue (Periode 2)	107
Vak: Science in Perspective (Periode 4+5)	108
Vak: Science Journalism (Periode 2)	109

Vak: Science Museology (Periode 3)	110
Vak: Science project (Ac. Jaar (september))	111
Vak: Scientific Writing in English (Periode 2, Periode 6)	112
Vak: Showcase 1 (Periode 1)	115
Vak: Showcase 2 (Periode 2)	115
Vak: Societal entrepreneurship in health and life sciences (Periode 1)	116
Vak: Statistical Data Analysis (Periode 1)	117
Vak: Statistical Physics and Condensed Matter Theory I (Periode 1)	118
Vak: Statistical Physics and Condensed Matter Theory I - Extension (Periode 3)	118
Vak: Statistical Physics and Condensed Matter Theory II (Periode 4+5+6)	118
Vak: Stochastic Simulation (Periode 2)	119
Vak: String Theory (Periode 5)	119
Vak: Strong Interactions 1 (Periode 4)	119
Vak: Strong Interactions 2 (Periode 5)	120
Vak: Student Seminar Theoretical Physics (Periode 6)	120
Vak: Superconductivity (Periode 2)	121
Vak: Technology and Innovation Processes (Periode 2)	121
Vak: Transdisciplinarity and Transition (Periode 2)	122
Vak: Tutoring Students (Periode 2)	124
Vak: Ultrafast Laser Physics (Periode 4)	125
Vak: Wetenschapscommunicatie voor Bèta-onderzoekers (Periode 5)	126

Specialization Science, Business & Innovation

The MSc-SBI program outlined below features two thematic lines: (1) life science, with an emphasis on drug development, molecular diagnostics and innovative medical instrumentation, and (2) energy science, with an emphasis on sustainable energy development. This program, combining the natural sciences with innovation skill sets from a business and organizational perspective is spread across a two-year MSc-program. The program is full time and taught in English. To obtain an MSc degree in SBI, students must earn 120 credits (EC) in courses according to the scheme below.

1. Natural sciences 36 EC

a. Science courses 12 EC

Compulsory choice:

b1. Science project (incl literature research and research skills) 24 EC

or b2. Researching science research 12 EC and Track courses 12 EC

2. Business and Social sciences 24 EC

3. Science, Business and Innovation 42 EC

a. SBI course 6 EC

b. SBI project (internship and master thesis) 36 EC

4. Complementary and/or electives 18 EC

In this program, students will be exposed to mandatory science classes, i.e. life science and/or energy science, to strengthen their background in natural sciences fundamentals. In addition, depending on the background of the students (either SBI BSc or other Bachelor degreed) there will be possibilities to define an appropriate customized MSc program. The chosen core will be complemented with a science project (24 EC) or the combination of Researching science research (12 EC) and Track courses (12 EC) for specialization in an area of interest, in either Life or Energy

science and with 24 EC in social and business sciences. The courses in social and business sciences focus on the processes and organizational context of innovation trajectories in business, industry and on institutional settings of inventions in life science and energy science and sustainability. The MSc-SBI is finalized through a final SBI-project of 36 EC (usually an internship at a company or institute) integrating the science, business and social aspects, leading to a Master's Thesis.

Opleidingsdelen:

- [Compulsory Choice 1 out of 2](#)
- [Compulsory Choice of 12 ec](#)
- [Compulsory Choice of 24 EC](#)
- [Recommended optional Courses](#)
- [Compulsory Courses](#)

Compulsory Choice 1 out of 2

Vakken:

Naam	Periode	Credits	Code
Business, Innovation and Value Creation in the Life Science Industry	Periode 3	6.0	X_432723

Current Sustainable Energy Technologies	Periode 3	6.0	X_422582
---	-----------	-----	----------

Compulsory Choice of 12 ec

Compulsory Choice of 12 EC from 1 of the following Science courses:

L&H:

Biomedical modeling and simulation 6 EC

Principles of Pharmaceutical Sciences/Pharmacochemistry 6 EC

Protein science 6 EC

Innovation in medical technology 6 EC

Chemical biology 6 EC

Green chemistry 6 EC

E&S:

Biosolar cells 6 EC

Chemical biology 6 EC

Green chemistry 6 EC

Photovoltaics 6 EC

Project sustainable future 6 EC

Materials for energy and environmental sustainability 12 EC

Vakken:

Naam	Periode	Credits	Code
Biomedical Modelling and Simulation	Periode 1	6.0	X_430112
BioSolar Cells	Periode 1	6.0	X_428531
Chemical Biology	Periode 1	6.0	X_432538
Green Chemistry	Periode 1	6.0	X_430557
Innovation in Medical Technology to Improve the Health Care System	Periode 6	6.0	X_430602
Organic Photovoltaics	Periode 5	6.0	X_422590
Principles of Pharmaceutical Sciences / Pharmacochemistry	Periode 1	6.0	X_435675
Project Sustainable Future	Periode 6	6.0	X_432784
Protein Science	Periode 1	6.0	AM_470145

Compulsory Choice of 24 EC

Vakken:

Naam	Periode	Credits	Code
Business & Innovation Project	Ac. Jaar (september)	24.0	XM_432845
Materials for energy and environmental sustainability	Periode 4+5	12.0	X_432850

Researching science research	Periode 4+5	12.0	X_432849
Science project	Ac. Jaar (september)	24.0	XM_422591

Recommended optional Courses

The students have to choose elective courses of 18 EC at the MSc level which have to be approved by the Examination Committee.

Vakken:

Naam	Periode	Credits	Code
Science and Society in Historical Perspective	Periode 4+5	6.0	X_400424
Technology and Innovation Processes	Periode 2	6.0	E_BA_TIP

Compulsory Courses

Vakken:

Naam	Periode	Credits	Code
Management of Sustainable Innovation	Periode 2	6.0	X_432739
Networked Organizations and Communication	Periode 2	6.0	S_NOC
SBI Project & Master Thesis	Ac. Jaar (september)	36.0	X_432735
SBI Research Methodology	Periode 1	6.0	X_432846
Transdisciplinarity and Transition	Periode 2	6.0	X_430604

Communication variant

This specialization is intended for students with a BSc degree in any of the bèta-studies who want to specialize in communication. The programme focuses on science communication theory, research and practice. The programme of the communication (C) specialization is 1 year (60 credits). This specialization may not be combined with the Societal specialization (M) or the Education specialization (E). C-courses are shared with master students from the Faculty of Earth and Life Sciences.

Programme

For a specialization degree it is required to spend 60 credits on Science Communication components. Two courses, one internship and a thesis are compulsory. The rest of the programme can be filled with optional courses. While science communication research is always a component of a students' internship, students have the opportunity to choose for placement at institutes such as newspapers, museums, science centers, companies, etc. to hone their practical as well as academic

skills. Students' thesis comprise short (9 credits) literature studies on research questions about aspects of science communication.

To complete his or her entire Master programme (120 credits), the student has to choose 60 credits Physics courses.

Before formal enrollment, the students' programme has to be approved by the master coordinator as well as the programme coordinator for the Science Communication.

Opleidingsdelen:

- [Courses for Communication Part](#)

Courses for Communication Part

To complete the Master programme (120 EC) of the Communication Variant, the student has to choose 60 EC Communication courses.

Opleidingsdelen:

- [Optional courses: select at least 12EC](#)
- [Internship communication](#)
- [Compulsory Courses](#)

Optional courses: select at least 12EC

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

Internship communication

Internship communication. Choose one.

Vakken:

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

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

Educatie variant

The teaching in these variant is mainly in Dutch. Therefore we also give the requirements in Dutch.

Programma

De opleiding voor het behalen van de eerstegraads lesbevoegdheid start twee keer per jaar, in september en in februari. De opleiding wordt aangeboden in twee semesters. Uitgaande van de start in september duurt semester 1 tot en met januari en semester 2 tot juli. De opleiding is sterk praktijkgericht. De helft van de opleiding bestaat uit praktijk door werkervaring of stage (ook wel schoolpracticum genoemd) op een school voor voortgezet onderwijs. Daarnaast kent de opleiding vier componenten: vakdidactiek, algemene didactiek/pedagogiek, praktijkonderzoek en verdiepingsmodulen.

Naast de educatievakken volgt de student 60 sp Physics vakken, in overleg met de mastercoördinator van de gekozen specialisatie. Hierbij zijn de twee vakken Literature thesis and Colloquium Physics Education Variant en Master Research Project Physics-Education Variant verplicht.

Studenten die bij de Communicatie variant de vakken 'interpersoonlijke communicatie' en 'museologie en buitenschoolse educatie' volgen, krijgen bij de lerarenopleiding een vrijstelling voor verdiepingsmodulen, een deel van het praktijkonderzoek en een deel van algemene didactiek.

Opleidingsdelen:

- [Master Leraar VHO Natuurkunde, vanaf 2015](#)
- [LVHO Natuurkunde, overgangsregeling](#)

Master Leraar VHO Natuurkunde, 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 Natuurkunde, overgangsregeling

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

Research Variant Particle Physics and Astroparticle Physics

What are the smallest building blocks ("particles") of the universe? Via which forces do these particles interact? Can one understand the apparently random particle masses? Why do we live in a matter (as opposed to anti-matter) dominated universe? These and many other questions are the context of experiments and theoretical work in (astro) particle physics. In particle accelerator experiments physicists investigate high energy interactions in a controlled environment that is thought to approach the conditions in the universe at a fraction of a second after the Big Bang. In non-accelerator experiments the physicists study the neutrino radiation from the sun, supernova and other speculative sources. Common features of the experiments in this field of physics are the state-of-the-art technology and innovative software (like distributed computing with the GRID-project).

More Information: <http://master.particles.nl/> .

The programme consists of 120 credits

- compulsory courses 78 credits (including a Master Project of 54 credits and a Colloquium and thesis report of 6 credits about the Master Project)
- compulsory optional choice 24 credits from a list
- optional courses 12 credits (free to choose)
- at least 6 credits Management, Communication or Education courses or academic skills

Note: Every programme, including the choice of optional courses, has to be discussed and agreed upon with the master coordinator or a personal

mentor and approved by the Examination Board.

Details about research in this master track can be found here
http://www.nat.vu.nl/en/research/astro_particle_physics/index.asp

Master coordinators

Dr. H.J. Bulten (VU)
T +31 (0) 20 5922018 (NIKHEF)
E hj.bulten@vu.nl

Dr. E. de Wolf (UvA)
T +31 (0) 20 592 5123
E e.dewolf@uva.nl

Opleidingsdelen:

- [Optional courses \(24 ec compulsory\)](#)
- [M, C, E Courses or academic Skills \(6 ec\)](#)
- [Compulsory Courses](#)
- [Expired Courses PPAP](#)

Optional courses (24 ec compulsory)

Students need to select a total of 24 credits or more from the following list.

Note: Every programme, including the choice of optional courses, has to be discussed and agreed upon with the master coordinator or a personal mentor and approved by the Examination Board.

Vakken:

Naam	Periode	Credits	Code
Astroparticle Physics	Periode 4	6.0	XMU_420005
Beyond the Standard Model	Periode 5	3.0	XMU_420192
CERN Research Project	Periode 6	6.0	XMU_420116
CERN Summer Student Lecture Programme	Zomerperiode	3.0	XMU_420122
Computational Methods	Periode 4	6.0	X_420014
General Relativity	Periode 4	6.0	XMU_420128
Gravitational Waves (Selected Topics in Gravitation and Cosmology)	Periode 5	3.0	XMU_428506
Mathematical Methods in Theoretical Physics 1	Periode 1	6.0	XMU_428573
Particle Cosmology	Periode 2	6.0	XMU_420560
Particle Detection	Periode 2	6.0	XMU_420051
Particles and Fields	Periode 4+5	6.0	XMU_420112
Programming C++	Periode 3	3.0	XMU_420141

Quantum Field Theory	Periode 2	6.0	XMU_420081
Statistical Data Analysis	Periode 1	6.0	XMU_420067
Strong Interactions 1	Periode 4	3.0	X_420233
Strong Interactions 2	Periode 5	3.0	XME_420234

M, C, E Courses or academic Skills (6 ec)

Students need to select at least 6 credits from the following list or a M, C, E course from the range of the M, C and E variants

Note: Every programme, including the choice of optional courses, has to be discussed and agreed upon with the master coordinator or a personal mentor and approved by the Examination Board.

Vakken:

Naam	Periode	Credits	Code
Scientific Writing in English	Periode 2, Periode 6	3.0	X_400592

Compulsory Courses

Vakken:

Naam	Periode	Credits	Code
Master Project Particle Physics and Astroparticle Physics	Ac. Jaar (september)	60.0	XM_422602
NIKHEF Project	Periode 5	6.0	XMU_420115
Particle Physics I	Periode 1	6.0	XMU_420052
Particle Physics II	Periode 2	6.0	XMU_420053

Expired Courses PPAP

Alleen voor studenten die de master Physics begonnen zijn op 01-09-2012 of eerder

Only for students who have started the Master Physics on or before September 1, 2012

Research Variant Theoretical Physics

The programme consists of 120 credits

- compulsory courses 78 credits (including a Master Project of 54 credits and a Colloquium and thesis report of 6 credits about the Master Project)
- compulsory optional choice 24 credits from a list
- optional courses 12 credits (free to choose)
- at least 6 credits Management, Communication or Education courses or

academic skills

Note: Every programme, including the choice of optional courses, has to be discussed and agreed upon with the master coordinator or a personal mentor and approved by the Examination Board.

Details about research in this master track can be found here
<http://tinyurl.com/qyk5n6g>

Master coordinators

Prof.dr. P.J.G. Mulders (VU)
K room T-222
T +31 (0) 20 598 7863
E pjg.mulders@few.vu.nl

Opleidingsdelen:

- [M, C, E Courses or academic Skills \(6 ec\)](#)
- [Optional courses \(24 ec compulsory\)](#)
- [Recommended elective courses](#)
- [Compulsory Courses](#)
- [Expired Courses TP](#)

M, C, E Courses or academic Skills (6 ec)

Students need to select at least 6 credits from the following list or a M, C, E course from the range of the M, C and E variants

Note: Every programme, including the choice of optional courses, has to be discussed and agreed upon with the master coordinator or a personal mentor and approved by the Examination Board.

Vakken:

Naam	Periode	Credits	Code
Scientific Writing in English	Periode 2, Periode 6	3.0	X_400592

Optional courses (24 ec compulsory)

Students need to select a total of 24 credits or more from the following list.

Note: Every programme, including the choice of optional courses, has to be discussed and agreed upon with the master coordinator or a personal mentor and approved by the Examination Board.

Vakken:

Naam	Periode	Credits	Code
------	---------	---------	------

Beyond the Standard Model	Periode 5	3.0	XMU_420192
Computational Methods	Periode 4	6.0	X_420014
General Relativity	Periode 4	6.0	XMU_420128
Mathematical Methods in Theoretical Physics 1	Periode 1	6.0	XMU_428573
Mathematical Methods in Theoretical Physics 2	Periode 2	6.0	XMU_428574
Particle Cosmology	Periode 2	6.0	XMU_420560
Particles and Fields	Periode 4+5	6.0	XMU_420112
Quantum Field Theory - Extension	Periode 3	3.0	XMU_422554
Statistical Physics and Condensed Matter Theory I - Extension	Periode 3	3.0	XMU_428519
Statistical Physics and Condensed Matter Theory II	Periode 4+5+6	6.0	XMU_420100
String Theory	Periode 5	6.0	XMU_400242

Recommended elective courses

Compulsory courses at the expense of the optional courses unless the content has already been covered in the bachelor programme.

Note: Every programme, including the choice of optional courses, has to be discussed and agreed upon with the master coordinator or a personal mentor and approved by the Examination Board.

Vakken:

Naam	Periode	Credits	Code
Mathematical Methods	Periode 4	6.0	X_420105

Compulsory Courses

Vakken:

Naam	Periode	Credits	Code
Master Project Theoretical Physics	Ac. Jaar (september)	60.0	X_422603
Quantum Field Theory	Periode 2	6.0	XMU_420081
Statistical Physics and Condensed Matter Theory I	Periode 1	6.0	XMU_420083
Student Seminar Theoretical Physics	Periode 6	6.0	XMU_420200

Expired Courses TP

Alleen voor studenten die de master Physics begonnen zijn op 01-09-2012 of eerder

Only for students who have started the Master Physics on or before September 1, 2012

Research Variant Advanced Matter and Energy Physics

The programme consists of 120 credits

- compulsory courses 24 credits (including a Colloquium and thesis report of 6 credits about the Master Project)
- compulsory master project 30 - 54 credits
- compulsory minor project if master project [Missing ITEM:] (the sum of the Master project and Minor project must be at least 54 credits)
- compulsory choice of 24 credits from a list
- optional courses 12 credits (free to choose)
- at least 6 credits Management, Communication or Education courses or academic skills. The compulsory course Survival Guide for scientists (3 ec) is part of this

Note: Every programme, including the choice of optional courses, has to be discussed and agreed upon with the master coordinator or a personal mentor and approved by the Examination Board.

Details about research in this master track can be found here

<http://www.nat.vu.nl/en/research/condensed-matter-physics/index.asp>

Master coordinator

Dr. H.L. Bethlem (VU)
K room T-264
T +31 (0) 20 598 7951
E h.l.bethlem@vu.nl

Opleidingsdelen:

- [Compulsory Choice Master Project](#)
- [Minor Project Choice](#)
- [M, C, E courses or academic Skills \(3 ec\)](#)
- [Optional courses \(12 ec compulsory\)](#)
- [Compulsory Choice \(6 ec\)](#)
- [Compulsory Courses](#)
- [Expired Courses AMEP](#)

Compulsory Choice Master Project

Students need to select one of the courses from the following list.

The sum of the Master project and Minor project must be at least 54 credits.

Note: Every programme, including the choice of optional courses, has to be discussed and agreed upon with the master coordinator or a personal mentor and approved by the Examination Board.

Vakken:

Naam	Periode	Credits	Code
Master Project Physics: AMEP	Ac. Jaar (september)	36.0	XM_422561
Master Project Physics: AMEP	Ac. Jaar (september)	42.0	XM_422562
Master Project Physics: AMEP	Ac. Jaar (september)	48.0	XM_422563
Master Project Physics: AMEP	Ac. Jaar (september)	54.0	XM_422564
Master Project Physics: AMEP	Ac. Jaar (september)	60.0	XM_422565

Minor Project Choice

Students need to select one of the courses from the following list if the Master Project is [Missing ITEM:]

The sum of the Master project and Minor project must be at least 54 credits.

Note: Every programme, including the choice of optional courses, has to be discussed and agreed upon with the master coordinator or a personal mentor and approved by the Examination Board.

Vakken:

Naam	Periode	Credits	Code
Minor Project Physics: AMEP	Ac. Jaar (september)	6.0	XM_422572
Minor Project Physics: AMEP	Ac. Jaar (september)	12.0	XM_422573
Minor Project Physics: AMEP	Ac. Jaar (september)	18.0	XM_422574
Minor Project Physics: AMEP	Ac. Jaar (september)	24.0	XM_422575

M, C, E courses or academic Skills (3 ec)

Students need to select at least 3 credits:

Scientific Writing in English or a M, C, E course from the range of the M, C and E variants

Note: Every programme, including the choice of optional courses, has to be discussed and agreed upon with the master coordinator or a personal mentor and approved by the Examination Board.

Vakken:

Naam	Periode	Credits	Code
Communication, Organization and Management	Periode 2	6.0	AM_470572
English Academic Course	Periode 2+3, Periode 5+6	3.0	XMU_437028
Entrepreneurship for Physicists	Periode 3	6.0	X_422600
Managing Science and Technology in Society	Periode 1	6.0	AM_470586
Research methods for analyzing complex problems	Periode 1	6.0	AM_1182
Science and Communication	Periode 1	6.0	AM_470587
Science in Dialogue	Periode 2	6.0	AM_1002
Science in Perspective	Periode 4+5	6.0	XMU_437030
Scientific Writing in English	Periode 2, Periode 6	3.0	X_400592
Tutoring Students	Periode 2	3.0	X_432625
Wetenschapscommunicatie voor Bèta-onderzoekers	Periode 5	6.0	AB_470185

Optional courses (12 ec compulsory)

Students need to select a total of 24 credits or more from the following list.

Note: Every programme, including the choice of optional courses, has to be discussed and agreed upon with the master coordinator or a personal mentor and approved by the Examination Board.

Vakken:

Naam	Periode	Credits	Code
Fermi Quantum Gases	Periode 5	6.0	XMU_428514
Mathematica for Physicists	Periode 3	3.0	XMU_428533
Nanophotonics	Periode 6	6.0	XMU_428537
Photosynthesis and Energy	Periode 5	6.0	X_422553
Photovoltaics	Periode 4	6.0	XMU_428516
Programming C++	Periode 3	3.0	XMU_420141
Superconductivity	Periode 2	6.0	XMU_428522
Ultrafast Laser Physics	Periode 4	6.0	X_422556

Compulsory Choice (6 ec)

Vakken:

Naam	Periode	Credits	Code
Statistical Physics and Condensed Matter Theory I	Periode 1	6.0	XMU_420083

Compulsory Courses

Vakken:

Naam	Periode	Credits	Code
Emergent Energy Materials	Periode 1	6.0	XMU_428571
Hydrodynamics	Periode 4	6.0	XMU_428536
Quantum optics	Periode 2	6.0	XMU_428535
Showcase 1	Periode 1	0.0	XMU_428576
Showcase 2	Periode 2	0.0	X_422609

Expired Courses AMEP

Alleen voor studenten die de master Physics begonnen zijn op 01-09-2012 of eerder

Only for students who have started the Master Physics on or before September 1, 2012

Research Variant Physics of Life and Health

The programme consists of 120 credits

- compulsory courses 12 credits (including a Colloquium and thesis report of 6 credits about the Master Project)
- compulsory master project 30 - 54 credits
- compulsory minor project if master project [Missing ITEM:] (the sum of the Master project and Minor project must be at least 54 credits)
- compulsory optional choice 12 credits
- compulsory optional choice 24 credits
- compulsory optional courses 12 credits (free to choose)
- at least 6 credits Management, Communication or Education courses or academic skills.

Note: Every programme, including the choice of optional courses, has to be discussed and agreed upon with the master coordinator or a personal mentor and approved by the Examination Board.

Details about research in this master track can be found here:

<http://www.nat.vu.nl/en/research/physics-life-health/index.asp>
(link to the Physics of Life group)

<http://tinyurl.com/qzz9uun>

(link to Biophysics and Medical Imaging)

Master coordinators

Dr. S.M. Witte (VU)

K room T-036A
T +31 (0) 20 59 84039
E stefan.witte@vu.nl

Opleidingsdelen:

- [Compulsory Choice Master Project](#)
- [Compulsory Choice Minor Project](#)
- [Optional courses \(12 ec compulsory\)](#)
- [Compulsory Choice \(12 ec\)](#)
- [M, C, E courses or academic Skills \(6 ec\)](#)
- [Compulsory Courses](#)
- [Expired Courses PLH](#)

Compulsory Choice Master Project

Students need to select one of the courses from the following list.

The sum of the Master project and Minor project must be at least 54 credits.

Note: Every programme, including the choice of optional courses, has to be discussed and agreed upon with the master coordinator or a personal mentor and approved by the Examination Board.

Vakken:

Naam	Periode	Credits	Code
Master Project Physics: PLH	Ac. Jaar (september)	36.0	XM_422541
Master Project Physics: PLH	Ac. Jaar (september)	42.0	XM_422542
Master Project Physics: PLH	Ac. Jaar (september)	48.0	XM_422543
Master Project Physics: PLH	Ac. Jaar (september)	54.0	XM_422544
Master Project Physics: PLH	Ac. Jaar (september)	60.0	XM_422545

Compulsory Choice Minor Project

Students need to select one of the courses from the following list if the Master Project is less than 54 credits.

The sum of the Master project and Minor project must be at least 54 credits.

Note: Every programme, including the choice of optional courses, has to be discussed and agreed upon with the master coordinator or a personal mentor and approved by the Examination Board.

Vakken:

Naam	Periode	Credits	Code
Minor Project Physics: PLH	Ac. Jaar (september)	6.0	XM_422548
Minor Project Physics: PLH	Ac. Jaar (september)	12.0	XM_422549
Minor Project Physics: PLH	Ac. Jaar (september)	18.0	XM_422550

Minor Project Physics: PLH	Ac. Jaar (september)	24.0	XM_422551
--	----------------------	------	-----------

Optional courses (12 ec compulsory)

Students need to select a total of 24 credits or more from the following list.

Note: Every programme, including the choice of optional courses, has to be discussed and agreed upon with the master coordinator or a personal mentor and approved by the Examination Board.

Vakken:

Naam	Periode	Credits	Code
Advanced 3D and 4D Medical Imaging	Periode 5	6.0	X_428569
Advanced Medical Image Processing	Periode 2	6.0	X_422610
Advanced Medical Technology	Periode 5	6.0	X_437026
Biomedical Modelling and Simulation	Periode 1	6.0	X_430112
Dynamics of Biomolecules and Cells	Periode 4	6.0	X_422583
Hydrodynamics	Periode 4	6.0	XMU_428536
Mathematica for Physicists	Periode 3	3.0	XMU_428533
Nanophotonics	Periode 6	6.0	XMU_428537
Parameter Estimation Applied to Medical and Biological Sciences	Periode 4	6.0	X_432631
Physics of Organs 2: Sensory Organs and Bioelectricity	Periode 2	6.0	XMU_428528
Stochastic Simulation	Periode 2	6.0	XMU_428577

Compulsory Choice (12 ec)

Vakken:

Naam	Periode	Credits	Code
Advanced MRI	Periode 6	6.0	X_428570
Advanced Spectroscopy	Periode 6	6.0	X_432767
From Genome to Physiome	Periode 6	6.0	XMU_420127
Laboratory challenge	Periode 6	3.0	X_422601

M, C, E courses or academic Skills (6 ec)

Vakken:

Naam	Periode	Credits	Code
Communication, Organization and Management	Periode 2	6.0	AM_470572
English Academic Course	Periode 2+3, Periode 5+6	3.0	XMU_437028
Entrepreneurship for Physicists	Periode 3	6.0	X_422600
Ethics in Biomedical Research	Periode 3	3.0	X_422592
Ethics in Life Sciences	Periode 3	3.0	AM_470707
Innovation in Medical Technology to Improve the Health Care System	Periode 6	6.0	X_430602
Managing Science and Technology in Society	Periode 1	6.0	AM_470586
Research methods for analyzing complex problems	Periode 1	6.0	AM_1182
Science and Communication	Periode 1	6.0	AM_470587
Science in Dialogue	Periode 2	6.0	AM_1002
Science in Perspective	Periode 4+5	6.0	XMU_437030
Scientific Writing in English	Periode 2, Periode 6	3.0	X_400592
Tutoring Students	Periode 2	3.0	X_432625
Wetenschapscommunicatie voor Bèta-onderzoekers	Periode 5	6.0	AB_470185

Compulsory Courses

Vakken:

Naam	Periode	Credits	Code
Light-tissue interaction	Periode 1	6.0	X_428572
Literature Study mPhys-PLH	Ac. Jaar (september)	6.0	XM_422585

Expired Courses PLH

Alleen voor studenten die de master Physics begonnen zijn op 01-09-2012 of eerder

Only for students who have started the Master Physics on or before September 1, 2012

Specialization Science for Energy and Sustainability

The programme consists of 120 credits

- compulsory courses 24 credits
- compulsory master project 30 - 60 credits
- compulsory minor project

Master coordinator

Dr. Raoul Frese (VU)
K room T-128
T +31 20 59 87263
E r.n.frese@vu.nl

Opleidingsdelen:

- [Compulsory Choice of at least 24 ec.](#)
- [Compulsory Choice Ethics and Portfolio Academic skills](#)
- [Compulsory Choice Master Project](#)
- [Minor Project Choice](#)
- [Compulsory Courses](#)

Compulsory Choice of at least 24 ec.

Vakken:

Naam	Periode	Credits	Code
BioSolar Cells	Periode 1	6.0	X_428531
Catalysis for sustainable energy	Periode 4	6.0	XMU_437027
Emergent Energy Materials	Periode 1	6.0	XMU_428571
Energy and Climate Change; Science, Policy and Economics	Periode 2	6.0	X_428568
Environmental Chemistry	Periode 1	6.0	XMU_437004
Green Chemistry	Periode 1	6.0	X_430557
Homogeneous Catalysis	Periode 5	6.0	XMU_435668
Management of Sustainable Innovation	Periode 2	6.0	X_432739
Open Innovation in Science and Sustainability	Periode 2	6.0	X_422598
Organic Photovoltaics	Periode 5	6.0	X_422590
Photosynthesis and Energy	Periode 5	6.0	X_422553
Photovoltaics	Periode 4	6.0	XMU_428516

Compulsory Choice Ethics and Portfolio Academic skills

Vakken:

Naam	Periode	Credits	Code
Communication, Organization and Management	Periode 2	6.0	AM_470572
English Academic Course	Periode 2+3, Periode 5+6	3.0	XMU_437028
Managing Science and Technology in Society	Periode 1	6.0	AM_470586
Research methods for analyzing complex problems	Periode 1	6.0	AM_1182
Science and Communication	Periode 1	6.0	AM_470587
Science in Dialogue	Periode 2	6.0	AM_1002
Science in Perspective	Periode 4+5	6.0	XMU_437030
Scientific Writing in English	Periode 2, Periode 6	3.0	X_400592
Tutoring Students	Periode 2	3.0	X_432625
Wetenschapscommunicatie voor Bèta-onderzoekers	Periode 5	6.0	AB_470185

Compulsory Choice Master Project

Vakken:

Naam	Periode	Credits	Code
Master Project SfES	Ac. Jaar (september)	36.0	XM_422594
Master Project SfES	Ac. Jaar (september)	42.0	XM_422595
Master Project SfES	Ac. Jaar (september)	48.0	XM_422596
Master Project SfES	Ac. Jaar (september)	54.0	XM_422597
Master Project SfES	Ac. Jaar (september)	60.0	XM_422604

Minor Project Choice

Vakken:

Naam	Periode	Credits	Code
Minor Project Physics: SfES	Ac. Jaar (september)	6.0	XM_422605
Minor Project Physics: SfES	Ac. Jaar (september)	12.0	XM_422606
Minor Project Physics: SfES	Ac. Jaar (september)	18.0	XM_422607
Minor Project Physics: SfES	Ac. Jaar (september)	24.0	XM_422608

Compulsory Courses

Vakken:

Naam	Periode	Credits	Code
Current Sustainable Energy Technologies	Periode 3	6.0	X_422582
Project Sustainable Future	Periode 6	6.0	X_432784

Society Oriented Variant for Natural and Life Sciences

Due to the growing complexity of technological and medical issues and the interaction with society, organisations working in this sector have a growing and urgent need for academic professionals in the natural and life sciences, who have knowledge of policy management and entrepreneurship. The Society oriented variant offers students with a bachelor degree in the natural and life sciences the chance to combine a specialization in this field with a specialization in research.

Programme

The programme of the Society oriented variant is equal to the first year of the master programme Management Policy- Analysis and entrepreneurship (MPA). The programme of the Society oriented variant consists of 60 cp (18 cp compulsory courses; 12 cp optional courses and 30 cp internship) The course language is English, unless all students participating in the course speak Dutch, the course language will be Dutch.

Apart from the communication courses, the student has to choose 60 sp Physics courses. The student has to discuss the programme with the master coordinator of the chosen specialisation.

Opleidingsdelen:

- [Courses for Society Oriented Part](#)

Courses for Society Oriented Part

To complete the Master programme (120 EC) of the Society Oriented Variant, the student has to choose 60 EC Society Oriented courses.

Opleidingsdelen:

- [MSc Biology Science in Society specialisation](#)

MSc Biology Science in Society specialisation

The Master's graduate with a Science in society specialization combines an academic approach with the skills and competences that will allow him or her to perform scientific research at the interface of the biomedical sciences and society. The specialization aims to develop strategies that contribute to an understanding of complex societal problems and strategies to solve complex societal problems through interdisciplinary research. In addition, the programme analyses the social, economic and ethical aspects of new developments in the biological 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 biological sciences) and societal actors, and the ability to use

these academic insights.

The Science in Society specialization has a study load of 54 EC.

Opleidingsdelen:

- [Compulsory courses](#)
- [Compulsory choice of at least 6 EC](#)

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_1134
Research methods for analyzing complex problems	Periode 1	6.0	AM_1182

Compulsory choice of at least 6 EC

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
Societal entrepreneurship in health and life sciences	Periode 1	6.0	AM_470575

Advanced 3D and 4D Medical Imaging

Vakcode	X_428569 ()
Periode	Periode 5
Credits	6.0

Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Lesmethode(n)	Hoorcollege
Niveau	500

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017-en/search-course>

Overige informatie

This course is part of the MSc Physics and Astronomy (joint degree) and is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Advanced Medical Image Processing

Vakcode	X_422610 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. ir. T.J.C. Faes
Examinator	dr. J.C. de Munck
Docent(en)	dr. ir. T.J.C. Faes, dr. J.C. de Munck
Lesmethode(n)	Hoorcollege, Computerpracticum
Niveau	400

Doel vak

- 1) To provide students with knowledge and skills to understand the state of the art of modern medical imaging analysis in one or more of the topics: Quantitative aspects of image analysis; Image matching; 4D image processing (motion correction, fMRI-image analysis); Meshing in 2D and 3D (e.g., the marching cube algorithms, Delaunay triangulation, data structures, interpolation, connected component algorithms, geometric modelling, optimized algorithms).
- 2) To develop from concept to algorithm and code (C++ or MATLAB) image analysis software tools in the form of an evaluated (efficacy) and documented programme code.

Onderwijsvorm

Lectures, literature review, workshops, demonstrations, computer practicles.

Toetsvorm

Individual end-of-course assignment on a specific topic in medical image processing, including the development and evaluation of the programme code and its documentation. Moreover, an oral and written presentation on the assignment is included.

Aanbevolen voorkennis

- Medische Beeldvorming (bachelor natuurkunde en bachelor medische natuurwetenschappen)

- Introductie medische beeldbewerking (bachelor natuurkunde en bachelor medische natuurwetenschappen).

Doelgroep

MNS-master & Master Physics of Life & Health

Advanced Medical Technology

Vakcode	X_437026 (437026)
Periode	Periode 5
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. ir. R.M. Verdaasdonk
Examinator	prof. dr. ir. R.M. Verdaasdonk
Docent(en)	prof. dr. ir. R.M. Verdaasdonk
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak

Understanding the physical principles of medical equipment in view of a safe and effective application.

Inhoud vak

The course consists of an overview of various medical devices discussing the physical principles and mechanism of action when used with a patient. The understanding of the physics contributes to the safety of the patient and the way the device can be applied most optimally. Particular devices will be discussed like electro-surgery, lasers, ultrasonic knives, endoscopes, etc. Also recent research and new developments of instruments will be shown.

Onderwijsvorm

Combination of lectures, practical hands-on with medical equipment, short projects of practical and literature research, oral project presentations.

Overige informatie

Students should also register in advance for this course on Blackboard.

Advanced MRI

Vakcode	X_428570 ()
Periode	Periode 6
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Niveau	500

Advanced Spectroscopy

Vakcode	X_432767 ()
Periode	Periode 6
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. F. Ariese
Examinator	dr. F. Ariese
Docent(en)	dr. F. Ariese
Lesmethode(n)	Hoorcollege
Niveau	500

Doel vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017/zoek-vak>

Overige informatie

This course is part of the MSc Chemistry (joint degree) and is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100. Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

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.

Astroparticle Physics

Vakcode	XMU_420005 (420005)
Periode	Periode 4
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H.J. Bulten
Examinator	dr. H.J. Bulten
Niveau	400

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2015-2016/zoek-vak/vak/19839>

Doelgroep

mPhys

Overige informatie

This course is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100. Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Beyond the Standard Model

Vakcode	XMU_420192 (420192)
Periode	Periode 5
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Niveau	500

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017/zoek-vak>

Overige informatie

This course is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100. Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Biomedical Modelling and Simulation

Vakcode	X_430112 (430112)
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. I.H.M. van Stokkum
Examinator	dr. I.H.M. van Stokkum
Docent(en)	dr. I.H.M. van Stokkum, dr. ir. T.J.C. Faes, dr. J.C. de Munck
Lesmethode(n)	Hoorcollege, Werkcollege, Practicum, Werkgroep
Niveau	400

Doel vak

To gain knowledge of the most important theoretical and practical concepts in modelling and simulation of biomedical processes at different scales, ranging from macroscopic organ function, cellular function down to biochemical interactions and signaling pathways within cells.

To gain experience with and to apply MatLab and Mathematica to acquire, analyse and evaluate biomedical signals and to model and simulate biomedical processes.

Inhoud vak

This course will start with a general overview the various types of models used to describe biomedical processes by parametric and non-parametric models using linear and non linear (differential) equations. Basic knowledge of vector and matrix calculations and differential equations is required but will be refreshed.

During the course, attention will be paid to viscoelastic models, spectral analysis, compartment models, geometric modelling used in image analysis and models to describe molecular structures and their dynamic behaviour.

Examples will concentrate on cardiovascular function: linear and nonlinear viscoelastic models of pressure volume relations, compartment models of the interaction between contractile proteins to simulate force and pressure development and a description of an ion pump for instance to import Ca-ions into the cell during an action potential.

The introductory lectures will be combined and followed by practical courses in which, through exercises, experience will be gained of MatLab and Mathematica (4th generation computer languages). Finally students will be offered a choice of 1 out of 5 modelling problems to be solved in small groups, guided by a supervisor. At the end of the course each group will present and discuss their work with all participants and supervisors of the course.

Onderwijsvorm

Lectures, working groups, assignments.

Toetsvorm

Assignments (20%), report and presentation on modelling problem (40%) and written exam (40%).

Literatuur

Syllabus.

Book (recommended): Gilat, A., MatLab: An Introduction with Applications, 5th ed, Wiley.

Doelgroep

mCh-SBI, mMNS-MPs, mMNS-PoL, mMNS-MPy, mPhys-PLH, mPhys-SBI

BioSolar Cells

Vakcode	X_428531 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J.P. Dekker
Examinator	dr. J.P. Dekker
Docent(en)	dr. J.P. Dekker, dr. R.N. Frese
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017-en/search-course>

Overige informatie

This course is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

For courses taught in period 1 and period 2, enrolment via <https://datanose.nl/#specialenrol> is required.

Business & Innovation Project

Vakcode	XM_432845 ()
Periode	Ac. Jaar (september)
Credits	24.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J.P. Dekker
Examinator	dr. J.P. Dekker
Niveau	400

Doel vak

This project is an alternative for the Science Project (X-422591), but only for those students who have performed a science-based project during their bachelor program, like students with completed chemistry, physics or related bachelors programs.

Course objective is similar to that of the Science Project, but a science base is not required.

Inhoud vak

See Science Project, except that this project is based on business and innovation instead of science.

Toetsvorm

Report and presentation

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

Business, Innovation and Value Creation in the Life Science Industry

Vakcode	X_432723 ()
Periode	Periode 3

Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	drs. P. van Hoorn
Examinator	drs. P. van Hoorn
Docent(en)	prof. dr. I.J.P. de Esch, drs. P. van Hoorn
Lesmethode(n)	Hoorcollege
Niveau	500

Doel vak

Business Innovation and Value Creation in the Life Sciences Industry aims to provide two distinct goals:

- a. To provide in depth and comprehensive insight in current business , innovation and entrepreneurship trends, approaches and state-of-the-art practice in the LSI through theory, literature and case analysis.
- b. To utilize and apply insights and experiences gained under a. in a personal live entrepreneurship case in which each individual student elects a case. And develops a business plan according to a set methodology. Essential parts of this process include: building strategy, business modeling, transactional modelling, building a value proposition, leveraging IP, marketing and commercialization planning.

Inhoud vak

The LSI landscape is shown in several ways:

1. Understanding the Pharma Biotech and Health Care sectors and its primary and secondary drivers, including the contributing sciences
2. Understanding relevant business, value chain and innovation models that are common in these industries and sectors
3. Understanding typical product life-cycle dynamics in the Pharma and Biotech and related Health sectors
4. Understanding the relative contribution and position of Genomics, Proteomics and other scientific specialization areas in the future of Health and Life Sciences
5. Understanding current product categories and the future of diagnosis, therapy and prevention

In addition to lectures on the above topics, students will be handed certain texts and articles that illustrate the `State of the Art' in the LSI sector from both a product development as well as from a business development standpoint.

As a result the student will get insight into the business decisions and dynamic that are linked to basic bio-scientific research from inception through to product development and commercialization. The course thus aims to provide a general overview of how life science and business are interwoven in everyday industrial practice.

Two `real-life' cases will be discussed and students will get a group assignment in which the cases will have to be analyzed and certain questions will have to be answered. Each group writes a short analysis and subsequently presents this in front of the whole group. Subsequently, each student will engage in a personal assignment as described above. The outputs will consist of a presentation before the whole group. The aim is to provide as real life a setting as is possible.

Onderwijsvorm

A mix of lectures, guest lectures, Pharma sector casework and related assignments. Individual coaching on the business planning exercise. Outputs include report and oral presentations and a final written exam.

Toetsvorm

In order to receive 6 credits for this course, the following criteria must be met:

- the written exam must be passed with a grade 6 or more (50% of final grade)
- the assignment must be completed with a written document and short presentation before the group (50% of final grade)

Literatuur

Selected scientific publications
Harvard Business Cases as posted on blackboard.
New World Drug Development by R Robert M. Rydzewski 2008
Business Model Generation – Osterwalder 2010

Vereiste voorkennis

Completed Bachelor SBI or comparable

Doelgroep

M Chem -SBI or M Physics - SBI

Overige informatie

In case you have any questions about this course, please contact the coordinator at p.van.hoorn@vu.nl;

Catalysis for sustainable energy

Vakcode	XMU_437027 ()
Periode	Periode 4
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Niveau	500

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017-en/search-course>

Overige informatie

This course is part of the MSc Chemistry (joint degree) and is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100. Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

CERN Research Project

Vakcode	XMU_420116 (420116)
Periode	Periode 6
Credits	6.0

Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H.J. Bulten
Examinator	dr. H.J. Bulten
Niveau	500

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2015-2016/zoek-vak/vak/14986>

Overige informatie

This course is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100. Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

CERN Summer Student Lecture Programme

Vakcode	XMU_420122 (420122)
Periode	Zomerperiode
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H.J. Bulten
Examinator	dr. H.J. Bulten
Niveau	500

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2015-2016/zoek-vak/vak/14985>

Doelgroep

mPhys

Overige informatie

This course is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100. Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Chemical Biology

Vakcode	X_432538 (432538)
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. R. Leurs
Examinator	prof. dr. R. Leurs
Docent(en)	prof. dr. R. Leurs
Lesmethode(n)	Hoorcollege, Computerpracticum
Niveau	400

Doel vak

To get students acquainted with modern chemical biology techniques to study proteins and the modulation of their function, with a specific emphasis on drug discovery

Inhoud vak

In this course emphasis will be given on the interface between Chemistry and Biology. How can one understand biological processes using small molecules? How can one identify small molecules targeting new biochemical pathways, either by using modern biochemical or cellular assays or in silico using the wealth of new information from structural biology? How to detect and/or modulate DNA, RNA and protein expression and/or function with chemical probes? These are the questions that are central to this course.

Onderwijsvorm

lectures, tutorial, consultancy sessions and case study/presentation

Toetsvorm

Students will work in small groups on an integrated case study. Based on primary literature, background information from Comprehensive Medicinal Chemistry, interaction with "Protein Champions", students will work on a "Chemical Biology Protein Report" and oral presentation. Finally, there will be a written examination at the end of the course on the various topics presented in the course.

Final grades will be based on results of the case study (35%), case presentation and discussion (15%) and final exam (50%). Each part must at least be satisfactory (mark "6 out of 10" or higher).

Literatuur

Selected book chapters from Comprehensive Medicinal Chemistry II, 2007, Elsevier, Editors-in-Chief: John B. Taylor and David J. Triggle (available at VU library as e-book) and primary literature.

Vereiste voorkennis

Bachelor Pharmaceutical Sciences, Medical Natural Science, Science, Business and Innovation or Chemistry. Portal course MSc Biomolecular Science or Principles of Pharmaceutical Sciences, Signal Transduction in Health and Disease, or equivalent for mBMS students and students with Bsc SBI or Chemistry.

With a BSc SBI or Chemistry, please contact prof. Leurs before registration on your eligibility to participate.

Doelgroep

mBMS-BC, mCh-SBI (2nd year), mDDS-BCCA, mDDS-CMCT, mDDS-DD&S, mDDS-DDSA, mDDS-DDTF, mDDS-C-var, mDDS-E-var, mDDS-M-var, mPhys-SBI (2nd year)

Intekenprocedure

Please register as soon as possible online.

Overige informatie

Presence is obliged at predefined moments of the course (e.g. kick-off meeting, computer practical, presentation session, examination) for finishing the course successfully.

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

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

Computational Methods

Vakcode	X_420014 (420014)
Periode	Periode 4
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H.J. Bulten
Examinator	dr. H.J. Bulten
Docent(en)	dr. H.J. Bulten
Lesmethode(n)	Hoorcollege, Werkcollege
Niveau	400

Doel vak

- Acquaintance with popular numerical methods in physics
- Critical assessment of numerical approaches
- Hands-on experience with the solution of problems in computational physics

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017-en/search-course>

Onderwijsvorm

Oral presentation and tutoring of pairs of students working on projects.

Toetsvorm

Exercises given during the course determine the grade.

Literatuur

Press, Teukolsky, Vetterling, and Flannery, Numerical Recipes. The version of this book for the programming language C is available on the web at <https://www.fizyka.umk.pl/nrbook/bookcpdf.html> .

Doelgroep

mPhys-TP, mPhys-PPAP

Overige informatie

This course is part of the MSc Physics and Astronomy (joint degree) and is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Current Sustainable Energy Technologies

Vakcode	X_422582 ()
Periode	Periode 3
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J.P. Dekker
Examinator	dr. J.P. Dekker
Docent(en)	dr. J.P. Dekker, dr. R.N. Frese
Lesmethode(n)	Hoorcollege, Werkcollege
Niveau	500

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017-en/search-course>

Overige informatie

This course is part of the MSc Physics and Astronomy (joint degree) and is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Didactiek 1

Vakcode	O_MLIDIDAC_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. 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)	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. 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, 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 voor differentiatie 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 reflectiekring 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)

Dynamics of Biomolecules and Cells

Vakcode	X_422583 ()
Periode	Periode 4
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. J.T.M. Kennis
Examinator	prof. dr. J.T.M. Kennis
Docent(en)	prof. dr. J.T.M. Kennis
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak

Life is, by its very definition, a dynamic quantity. In this course an overview is given of dynamic processes that take place in biomolecules, membranes and cells in relation to biological functionality, and the biophysical methods that are applied to study them.

Inhoud vak

The significance of small movements to large-scale and slow reorganizations are being discussed as well the experimental techniques employed.

- DNA processing and dynamics (techniques: optical tweezers, AFM, tethered particle motion, magnetic tweezers). DNA structure and stability, DNA/RNA polymerase, DNA architectural proteins, DNA repair.
- Protein dynamics (techniques: ultrafast spectroscopy, Infrared and Raman spectroscopy, single-molecule fluorescence). Photoactive proteins, light-driven enzymes, Motor proteins, optogenetics.
- Membrane dynamics and remodeling (techniques AFM, single molecule, electron microscopy). Photosynthesis, crowding and membrane protein diffusion, Neuroimaging.
- superresolution microscopy

Onderwijsvorm

Lectures, guest lectures, literature essay, oral literature presentation

Toetsvorm

- Essay (literature or research proposal)
- Oral literature presentation
- written Exam

Literatuur

Notes, handouts and papers.

Vereiste voorkennis

BSc. Physics, BSc. Medical Natural Sciences, BSc Chemistry or comparable

Doelgroep

mMNS-PoL, mPhys-LSBP, mPhys-PLH

Emergent Energy Materials

Vakcode	XMU_428571 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Niveau	400

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017-en/search-course>

Intekenprocedure

Registration is required via <https://www.sis.uva.nl> during the registration term before the start of the semester.

Overige informatie

This course is part of the MSc Physics and Astronomy (joint degree) and is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Energy and Climate Change; Science, Policy and Economics

Vakcode	X_428568 ()
Periode	Periode 2

Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Niveau	400

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017-en/search-course>

Overige informatie

This course is part of the MSc Physics and Astronomy (joint degree) and is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

English Academic Course

Vakcode	XMU_437028 ()
Periode	Periode 2+3, Periode 5+6
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Niveau	400

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017-en/search-course>

Overige informatie

This course is part of the MSc Chemistry (joint degree) and is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Entrepreneurship for Physicists

Vakcode	X_422600 ()
Periode	Periode 3
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. D. Iannuzzi
Examinator	prof. dr. D. Iannuzzi
Docent(en)	prof. dr. D. Iannuzzi, prof. dr. E. Masurel, dr. M.W. van Gelderen
Lesmethode(n)	Hoorcollege
Niveau	500

Doel vak

After the successful completion of this course, the student will, among others:

- Be familiar with an innovation outlook on entrepreneurship;

- Be aware that value-adding opportunities not only contain financial aspects but also social and ecological aspects (sustainable entrepreneurship);
- Have developed insight into, and actual developed, one's own enterprising competencies;
- Have learned about the processes involved in the recognition and exploitation of opportunities, about creating societal value and about the nature and role of networks;
- Have gained the ability to write a feasibility plan on how to bring an innovation to the market;
- Have gained knowledge of different entrepreneurial processes and the importance of valorization of scientific findings and business ideas for a knowledge-based economy.

Inhoud vak

Entrepreneurship, defined here as 'creation, discovery and exploitation of value-adding opportunities', is an increasingly important subject for students and professionals, also in the discipline of physics. The growing complexity and accelerating dynamics of the technologies that lie behind life sciences pre-clinical studies, medical treatments, alternative and sustainable energy sources, innovative materials, micro- and nanodevices, and complex research projects in the high energy particle physics and astrophysics sectors often urge professionals to think, act, and communicate in an entrepreneurial way. In this course, students will learn the ropes of this emerging field via three educational pillars:

1) Students will be learning modern theories of entrepreneurship, with focus on the relationship between entrepreneurship and innovation, sustainable entrepreneurship, life cycle of the firm, valorization of knowledge, entrepreneurial competences;

2) They will familiarize with a set of entrepreneurial soft skills, which they will put into practice when they will be asked to approach different stakeholders to further their projects to gain commitments or to obtain important information. For this purpose, the students will receive training in taking action, networking and network utilization, and influence processes;

3) They will be introduced to business planning. For this purpose, the students, supported by guest lecturers and coaching sessions, will write (in small groups) a Business Model Canvas (BMC 3.0) around an innovative idea that they deem interesting for entrance into the market.

All projects and initiatives will of course revolve around innovative ideas emerging from physics research activities.

Environmental Chemistry

Vakcode	XMU_437004 (437004)
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Niveau	400

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017/zoek-vak>

Overige informatie

This course is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904,

servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

For courses taught in period 1 and period 2, enrolment via

<https://datanose.nl/#specialenrol> is required.

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

Robert Borst

Ethics in Biomedical Research

Vakcode	X_422592 ()
Periode	Periode 3
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
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, P. Klaassen MA
Lesmethode(n)	Hoorcollege, Werkcollege, Werkgroep
Niveau	400

Doel vak

The objectives of this course are:

- To acquire insight in and understanding of the central concepts and theories in applied philosophy and professional ethics,
- To understand the instrumental role of professional codes of conduct, the role of ethical review committees in medical research, ethical aspects of translational research and the challenges of being an ethically responsible researcher;
- Can interpret and reflect on relevant key concepts in ethics, including moral dilemmas;
- Being able to have an open and respectful attitude with respect to different value patterns;

- To acquire insights into various methods and analytical tools to identify and analyse ethical dilemmas in order to formulate proper justifications;

-Can apply these various methods and analytical tools in the context of medical natural science and to facilitate constructive discussions about ethical aspects.

Inhoud vak

Researchers in medical natural sciences generate knowledge and applications that, for example, offer new and improved options for prevention, diagnosis, treatment and enhancement, which can profoundly change people's lives. It is therefore important that researchers take responsibility for the decisions they make when designing and implementing applications. In this course you will acquire and apply theoretical knowledge and skills to critically analyse complex case studies in order to formulate proper justifications and establish fair decision-making. Relevant case studies in the field of medical natural sciences will be used as illustration. In small work groups, you are encouraged to critically analyse and deal with ethical dilemmas.

Onderwijsvorm

The total study time is 80 hours. The different course elements have the following study time:

Lectures: 9 hours; Work groups: 19 hours; Exam: 2 hours; Self-study: 50 hours.

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 work groups, and to pass the exam.

Toetsvorm

- Degree of intellectual participation in the workgroups (10%)

- Exam (50%)

- written and verbal execution of the moral dialogue: assignment 'start position' (20%) and assignment 'middle ground' (20%)

All three elements have to be passed.

Literatuur

Available on Blackboard

Vereiste voorkennis

BSc Medical Natural science or equivalent BSc

Research experience

Doelgroep

Students of master Medical Natural Sciences

Intekenprocedure

VUnet

Overige informatie

Lectures in English, part of the workgroups are in Dutch when appropriate. All presentations and plenary discussions in English. Attendance to work groups is compulsory.

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.

Fermi Quantum Gases

Vakcode	XMU_428514 (428514)
Periode	Periode 5
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Niveau	400

Inhoud vak

The course description is available on

<http://studiegids.uva.nl/xmlpages/page/2015-2016/zoek-vak/vak/11045>

Overige informatie

This course is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

From Genome to Physiome

Vakcode	XMU_420127 (420127)
Periode	Periode 6
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Niveau	400

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017/zoek-vak>

Doelgroep

mPhys-PLH

Overige informatie

Opgave via <https://www.sis.uva.nl> tot 4 weken voor aanvang van het semester is verplicht

Course registration at the UvA is compulsory at least 4 weeks before the start of the semester via <https://www.sis.uva.nl>

UvA coordinator: dr. N.T.P. Bakker

General Relativity

Vakcode	XMU_420128 (420128)
Periode	Periode 4
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Lesmethode(n)	Hoorcollege
Niveau	400

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017/zoek-vak>

Overige informatie

This course is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Gravitational Waves (Selected Topics in Gravitation and Cosmology)

Vakcode	XMU_428506 (428506)
Periode	Periode 5
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H.J. Bulten
Examinator	dr. H.J. Bulten
Niveau	400

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2015-2016/zoek-vak/vak/18230>

Overige informatie

This course is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904,

servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.
Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Green Chemistry

Vakcode	X_430557 (430557)
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J.C. Slootweg
Examinator	dr. J.C. Slootweg
Lesmethode(n)	Hoorcollege
Niveau	400

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017-en/search-course>

Overige informatie

This course is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100. Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required. For courses taught in period 1 and period 2, enrolment via <https://datanose.nl/#specialenrol> is required.

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)

Homogeneous Catalysis

Vakcode	XMU_435668 (435668)
Periode	Periode 5
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Lesmethode(n)	Hoorcollege
Niveau	400

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017-en/search-course>

Overige informatie

This course is part of the MSc Chemistry (joint degree) and is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100. Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Hydrodynamics

Vakcode	XMU_428536 ()
Periode	Periode 4
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Niveau	500

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017/zoek-vak/vak/23186>

Overige informatie

This course is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100. Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Innovation in Medical Technology to Improve the Health Care System

Vakcode	X_430602 ()
Periode	Periode 6
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. ir. T.J.C. Faes
Examinator	dr. ir. T.J.C. Faes
Docent(en)	dr. ir. T.J.C. Faes
Lesmethode(n)	Hoorcollege, Werkcollege
Niveau	500

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017-en/search-course>

Overige informatie

This course is part of the MSc Physics and Astronomy (joint degree) and is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Internship Science in Society

Vakcode	AM_1134 ()
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

Research internship

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 specialization coordinator.

Overige informatie

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

Information on internships is made available on Blackboard.

Laboratory challenge

Vakcode	X_422601 ()
Periode	Periode 6
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen

Coördinator	prof. dr. D. Iannuzzi
Examinator	prof. dr. D. Iannuzzi
Docent(en)	prof. dr. D. Iannuzzi
Lesmethode(n)	Hoorcollege
Niveau	400

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017-en/search-course>

Overige informatie

This course is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100. Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Light-tissue interaction

Vakcode	X_428572 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Lesmethode(n)	Hoorcollege
Niveau	500

Doel vak

After the successful completion of this course, the student will, among others:

- Be familiar with physical foundation of elastic and in-elastic interaction of light with biological materials and with biological material model systems.
- Be familiar with the most prominent dynamic light scattering techniques and their physical background
- Be familiar with state-of-the art measurement technologies and the underlying physics.

Inhoud vak

In this course students focus on the physical background of the interaction of light with biological materials and biologic material model systems. The course rests on 3 pillars:

I: Fundamentals of light-tissue interaction. Topics include:

- Physical origin of optical contrast in biologic materials; complex refractive index, dispersion relations and Kramers-Kronig equations; complex refractive index of water and blood.
- Absorption and the 'fate of light in tissue'; Absorption by molecules in dilutions and suspensions; absorption flattening due to packing of hemoglobin in red blood cells; and of red blood cells in vessels.
- Elastic scattering (Dipole/Rayleigh scattering, Mie scattering); physical properties of discrete random media (DRM) and continuous random media and their consequences for light scattering (structure factor).
- Propagation of light in tissue: Radiative Transport Equation (RTE), the light-Diffusion approximation to the RTE in 1 and 3 dimensions; Monte Carlo methods for simulating light transport.

- Light scattering of small particles in water, light scattering in dilute and turbid media.

II: Dynamic Light scattering: scattering of light from particles in motion. Topics include:

- Dynamic light scattering (DLS) for quantification of dynamics (Brownian motion, Diffusion, flow)
- Diffusing Wave Spectroscopy (DLS in the multiple scattering regime)
- Laser Speckle Contrast Imaging for quantitative blood flow velocity imaging
- Laser Doppler Flowmetry.

III: Specialized topics in Light-tissue interaction: state-of-the art techniques and hot topics in light-tissue interaction. Topics include:

- Vesicle detection, flow cytometry
- Low coherence interferometry (Optical Coherence Tomography, Low Coherence Spectroscopy, Low Coherent Enhanced Backscattering)
- Multiphoton microscopy (multi-photon fluorescence, second harmonic generation).

Toetsvorm

written test after pillar 1 and 2, literature assignment after pillar 3.

Doelgroep

mPHY

Literature Study mPhys-PLH

Vakcode	XM_422585 ()
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. D. Iannuzzi
Examinator	prof. dr. D. Iannuzzi
Niveau	600

Management of Sustainable Innovation

Vakcode	X_432739 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. R.J.A. Klein Woolthuis
Examinator	dr. R.J.A. Klein Woolthuis
Docent(en)	dr. R.J.A. Klein Woolthuis
Lesmethode(n)	Hoorcollege, Werkcollege
Niveau	400

Inhoud vak

Overige informatie

This course is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100. Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required. For courses taught in period 1 and period 2, enrolment via <https://datanose.nl/#specialenrol> is required.

Managing Science and Technology in Society

Vakcode	AM_470586 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. T.J. Schuitmaker-Warnaar
Examinator	dr. T.J. Schuitmaker-Warnaar
Docent(en)	dr. J.F.H. Kupper, dr. C.W.M. Dedding, dr. T.J. Schuitmaker-Warnaar, P. Klaassen MA, prof. dr. J.E.W. Broerse, dr. B.J. Regeer
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	600

Doel vak

In this course, students:

- acquire knowledge and understanding of philosophical and social science theories on science and technology development.
- gain insight into the mutual shaping of science & technology and society.
- acquire knowledge and understanding of the basic concepts and issues in the field of science and technology studies.
- acquire knowledge and understanding of technological development through Responsible Research and Innovation
- acquire knowledge and understanding of interactive methods for directing and guiding developments in science and technology.
- gain insight into the need for democratization of science and technology.
- learn to recognize and operate the central STS concepts in their own life worlds.
- learn to communicate verbally and in scientific writing about their knowledge and understanding and to critically reflect on that.

Inhoud vak

The 'Managing Science and Technology in Society' course offers an advanced introduction into the academic field of 'Science Technology & Society Studies', as part of the second year of the master 'Management, Policy Analysis and Entrepreneurship for the Health and Life Sciences'.

As a MPA student you are trained to operate at the interface of your natural science discipline and society, thereby making a contribution to answering the complex social problems arising in these areas. At the dawn of the 21st century, technology and science have an enormous potential for transforming life on earth. At the same time, the

dimensions of our human culture shape the directions in which science and technology develop. The production of scientific knowledge and technological artefacts can solve some of our problems, but at the same time they give rise to new problems. During this course you will study the interactions of science and technology with society, and the various ways in which they mutually shape one another. These interactions invoke a lot of questions. Should we embrace genetically modified food? How do new human reproductive technologies interfere with the way we deal with sexuality and social responsibilities?

In this course you will get acquainted with a conceptual framework to critically assess these kinds of questions. It aims at understanding the intertwinement of science, technology and society, and the importance of a broad concern with these interactions, in order to shape our future in the way that we want it.

Onderwijsvorm

'Managing Science and Technology in Society' is a fulltime course of four weeks (6 ECTS). The course schedule is available on blackboard. The total study time is 168 hours. Tuition methods include lectures, work groups, a group project and self-study.

The different elements have the following study time:

- o lectures 22 hours
- o work groups 12 hours
- o group project 32 hours
- o self study (including mini-essays) 88 hours
- o examination (take-home) 14 hours

Toetsvorm

The examination consists of:

- Mini-essay 1 (20%)
- Mini-essay 2 (20%)
- Final essay (take-home essay exam) (40%)
- SCOB-project (20%)

All parts need to be passed.

Literatuur

The literature of this course consists of selected chapters from the book "An introduction to science and technology studies", Sergio Sismondo 2010, which can be purchased at the VU book shop. Complementary articles are provided for via blackboard.

Doelgroep

This is a compulsory course for second year students of the master Management, Policy Analysis and Entrepreneurship in the Health and Life Sciences. The course is optional for other Master students at the faculty of Health and Life Sciences.

Overige informatie

More information: T.J.Schuitmaker@vu.nl

Master Project Particle Physics and Astroparticle Physics

Vakcode	XM_422602 ()
Periode	Ac. Jaar (september)

Credits	60.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H.J. Bulten
Examinator	dr. H.J. Bulten
Niveau	600

Master Project Physics: AMEP

Vakcode	XM_422561 (422561)
Periode	Ac. Jaar (september)
Credits	36.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H.L. Bethlem
Examinator	dr. H.L. Bethlem
Niveau	600

Master Project Physics: AMEP

Vakcode	XM_422562 (422562)
Periode	Ac. Jaar (september)
Credits	42.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H.L. Bethlem
Examinator	dr. H.L. Bethlem
Niveau	600

Master Project Physics: AMEP

Vakcode	XM_422563 (422563)
Periode	Ac. Jaar (september)
Credits	48.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H.L. Bethlem
Examinator	dr. H.L. Bethlem
Niveau	600

Master Project Physics: AMEP

Vakcode	XM_422564 (422564)
Periode	Ac. Jaar (september)

Credits	54.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H.L. Bethlem
Examinator	dr. R.J. Wijngaarden
Niveau	600

Master Project Physics: AMEP

Vakcode	XM_422565 ()
Periode	Ac. Jaar (september)
Credits	60.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H.L. Bethlem
Examinator	dr. H.L. Bethlem
Niveau	600

Master Project Physics: PLH

Vakcode	XM_422541 (422541)
Periode	Ac. Jaar (september)
Credits	36.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. D. Iannuzzi
Examinator	prof. dr. D. Iannuzzi
Niveau	600

Master Project Physics: PLH

Vakcode	XM_422542 (422542)
Periode	Ac. Jaar (september)
Credits	42.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. D. Iannuzzi
Examinator	prof. dr. D. Iannuzzi
Niveau	600

Master Project Physics: PLH

Vakcode	XM_422543 (422543)
Periode	Ac. Jaar (september)

Credits	48.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. D. Iannuzzi
Examinator	prof. dr. D. Iannuzzi
Niveau	600

Master Project Physics: PLH

Vakcode	XM_422544 (422544)
Periode	Ac. Jaar (september)
Credits	54.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. D. Iannuzzi
Examinator	prof. dr. D. Iannuzzi
Niveau	600

Master Project Physics: PLH

Vakcode	XM_422545 (422545)
Periode	Ac. Jaar (september)
Credits	60.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. D. Iannuzzi
Examinator	prof. dr. D. Iannuzzi
Niveau	600

Master Project SfES

Vakcode	XM_422594 ()
Periode	Ac. Jaar (september)
Credits	36.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. J.T.M. Kennis
Examinator	prof. dr. J.T.M. Kennis
Niveau	600

Master Project SfES

Vakcode	XM_422595 ()
Periode	Ac. Jaar (september)

Credits	42.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. J.T.M. Kennis
Examinator	prof. dr. J.T.M. Kennis
Niveau	600

Master Project SfES

Vakcode	XM_422596 ()
Periode	Ac. Jaar (september)
Credits	48.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. J.T.M. Kennis
Examinator	prof. dr. J.T.M. Kennis
Niveau	600

Master Project SfES

Vakcode	XM_422597 ()
Periode	Ac. Jaar (september)
Credits	54.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. J.T.M. Kennis
Examinator	prof. dr. J.T.M. Kennis
Niveau	600

Master Project SfES

Vakcode	XM_422604 ()
Periode	Ac. Jaar (september)
Credits	60.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. J.T.M. Kennis
Examinator	prof. dr. J.T.M. Kennis
Niveau	600

Master Project Theoretical Physics

Vakcode	X_422603 ()
Periode	Ac. Jaar (september)

Credits	60.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. P.J.G. Mulders
Examinator	prof. dr. P.J.G. Mulders
Niveau	600

Materials for energy and environmental sustainability

Vakcode	X_432850 ()
Periode	Periode 4+5
Credits	12.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J.P. Dekker
Examinator	dr. J.P. Dekker
Docent(en)	dr. J.P. Dekker
Lesmethode(n)	Hoorcollege
Niveau	500

Inhoud vak

This course will help you understand critical relationships between the environment, energy and sustainability. The course will provide comprehensive coverage of each topic, bringing together diverse subject matter by integrating theory with engaging insights. It includes helpful features to aid understanding, including a historical overview and suggested questions for discussion.

Literatuur

Book 'Fundamentals of Materials for Energy and Environmental Sustainability' by D.S. Ginley and D. Cahen (MRS, Cambridge University Press)

Doelgroep

Master SBI, track Life & Health and Energy & Sustainability

Mathematica for Physicists

Vakcode	XMU_428533 ()
Periode	Periode 3
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Niveau	500

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2015-2016/zoek-vak/vak/12391>

Overige informatie

This course is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Mathematical Methods

Vakcode	X_420105 (420105)
Periode	Periode 4
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. F.C. Mac Kintosh
Examinator	prof. dr. F.C. Mac Kintosh
Docent(en)	B.L.G. Bakker
Lesmethode(n)	Hoorcollege, Werkcollege
Niveau	300

Doel vak

Introduction to mathematical techniques that are particularly useful in theoretical physics.

Inhoud vak

Calculus of variations; Classical field theories; Greens functions and applications; Linear spaces and orthogonal functions.

Onderwijsvorm

Lectures and working classes.

Toetsvorm

Written exam and homework.

Literatuur

Mathematics of Classical and Quantum Physics, Byron and Fuller.

Theoretical Mechanics of Particles and Continua, Fetter and Walecka.

Doelgroep

3N, 3WN, mPhys

Overige informatie

Gezien het accent dat gelegd wordt op praktische vaardigheden is het noodzakelijk regelmatig tijd te besteden aan de vraagstukken.

Mathematical Methods in Theoretical Physics 1

Vakcode	XMU_428573 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. P.J.G. Mulders

Examinator	prof. dr. P.J.G. Mulders
Niveau	500

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2015-2016/zoek-vak/vak/1132310>

Overige informatie

This course is offered at the UvA. For more information contact: FNWI

Education Service Centre, Science Park 904,

servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Mathematical Methods in Theoretical Physics 2

Vakcode	XMU_428574 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. P.J.G. Mulders
Examinator	prof. dr. P.J.G. Mulders
Lesmethode(n)	Hoorcollege
Niveau	500

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2015-2016/zoek-vak/vak/1132311>

Intekenprocedure

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Overige informatie

This course is offered at the UvA. For more information contact: FNWI

Education Service Centre, Science Park 904,

servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Minor Project Physics: AMEP

Vakcode	XM_422572 (422572)
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H.L. Bethlem
Examinator	dr. H.L. Bethlem
Niveau	500

Minor Project Physics: AMEP

Vakcode	XM_422573 (422573)
----------------	--------------------

Periode	Ac. Jaar (september)
Credits	12.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H.L. Bethlem
Examinator	dr. H.L. Bethlem
Niveau	500

Minor Project Physics: AMEP

Vakcode	XM_422574 (422574)
Periode	Ac. Jaar (september)
Credits	18.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H.L. Bethlem
Examinator	dr. H.L. Bethlem
Niveau	500

Minor Project Physics: AMEP

Vakcode	XM_422575 (422575)
Periode	Ac. Jaar (september)
Credits	24.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H.L. Bethlem
Examinator	dr. H.L. Bethlem
Niveau	500

Minor Project Physics: PLH

Vakcode	XM_422548 (422548)
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. D. Iannuzzi
Examinator	prof. dr. D. Iannuzzi
Niveau	500

Minor Project Physics: PLH

Vakcode	XM_422549 (422549)
----------------	--------------------

Periode	Ac. Jaar (september)
Credits	12.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. D. Iannuzzi
Examinator	prof. dr. D. Iannuzzi
Niveau	500

Minor Project Physics: PLH

Vakcode	XM_422550 (422550)
Periode	Ac. Jaar (september)
Credits	18.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. D. Iannuzzi
Examinator	prof. dr. D. Iannuzzi
Niveau	500

Minor Project Physics: PLH

Vakcode	XM_422551 (422551)
Periode	Ac. Jaar (september)
Credits	24.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. D. Iannuzzi
Examinator	prof. dr. D. Iannuzzi
Niveau	500

Minor Project Physics: SfES

Vakcode	XM_422605 ()
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. J.T.M. Kennis
Examinator	prof. dr. J.T.M. Kennis
Niveau	500

Minor Project Physics: SfES

Vakcode	XM_422606 ()
----------------	--------------

Periode	Ac. Jaar (september)
Credits	12.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. J.T.M. Kennis
Examinator	prof. dr. J.T.M. Kennis
Niveau	500

Minor Project Physics: SfES

Vakcode	XM_422607 ()
Periode	Ac. Jaar (september)
Credits	18.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. J.T.M. Kennis
Examinator	prof. dr. J.T.M. Kennis
Niveau	500

Minor Project Physics: SfES

Vakcode	XM_422608 ()
Periode	Ac. Jaar (september)
Credits	24.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. J.T.M. Kennis
Examinator	prof. dr. J.T.M. Kennis
Niveau	500

Nanophotonics

Vakcode	XMU_428537 ()
Periode	Periode 6
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Niveau	500

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017/zoek-vak/vak/26719>

Overige informatie

This course is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Networked Organizations and Communication

Vakcode	S_NOC ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Sociale Wetenschappen
Coördinator	dr. A. Nerghes
Examinator	dr. A. Nerghes
Docent(en)	dr. A. Nerghes
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	600

Doel vak

Students who have completed the seminar will be able to critically approach, interpret, and compare theories and literature on social networks, semantic networks, and networked organizations. They can write a literature review or about the developing field of networked organizations and communication. Moreover, they can carry out a small-scale research project (in groups) using a network software tool to conduct social and semantic network analysis, and reflect on the results.

Inhoud vak

The seminar Networked Organizations and Communication aims at gaining in-depth insight into networked organizations and network analysis. The seminar begins with an introduction to network theory, general terms, and concepts. On the basis of recent network literature, the seminar then focuses on how organizations and organizational members become more connected to each other (e.g., through actor similarity, communication patterns, etc.). A particular focus will thus be on gaining insights into social and semantic networks and on the software program with which one can analyze and visualize social or semantic networks. This course addresses three aspects of organizational networks: structure, content and meaning.

Toetsvorm

Possibly small tests during class, individual literature review, group assignment (research project), and an individual reflection assignment.

Aanbevolen voorkennis

All students are recommended to study chapters 1, 2, 3, 7, and 10 of Kadushi, C., 2012: Understanding social networks. Oxford University Press: New York.

Intekenprocedure

In this course you can not enroll yourself for the tutorials, but you will be assigned by the course coordinator. You will find to which tutorial you are assigned in your personal schedule in VUnet.
Note: You do have to register for the course, with the remaining corresponding parts!

NIKHEF Project

Vakcode	XMU_420115 (420115)
Periode	Periode 5
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H.J. Bulten
Examinator	dr. H.J. Bulten
Lesmethode(n)	Hoorcollege
Niveau	600

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2015-2016/zoek-vak/vak/16784>

Overige informatie

This course is offered at the UvA. For more information contact: FNWI

Education Service Centre, Science Park 904,

servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Open Innovation in Science and Sustainability

Vakcode	X_422598 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	drs. P. van Hoorn
Examinator	drs. P. van Hoorn
Docent(en)	drs. P. van Hoorn
Lesmethode(n)	Hoorcollege
Niveau	400

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017-en/search-course>

Overige informatie

This course is offered at the UvA. For more information contact: FNWI

Education Service Centre, Science Park 904,

servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

For courses taught in period 1 and period 2, enrolment via

<https://datanose.nl/#specialenrol> is required.

Organic Photovoltaics

Vakcode	X_422590 ()
Periode	Periode 5
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen

Coördinator	dr. E.L. von Hauff
Examinator	dr. E.L. von Hauff
Docent(en)	dr. E.L. von Hauff
Lesmethode(n)	Hoorcollege
Niveau	400

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017-en/search-course>

Overige informatie

This course is part of the MSc Physics and Astronomy (joint degree) and is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Parameter Estimation Applied to Medical and Biological Sciences

Vakcode	X_432631 (432631)
Periode	Periode 4
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J.C. de Munck
Examinator	dr. J.C. de Munck
Docent(en)	dr. J.C. de Munck
Lesmethode(n)	Hoorcollege, Practicum
Niveau	500

Doel vak

The course treats the theory of parameter estimation problems in general, but the theory is illustrated extensively by examples from medical and biological sciences and brain imaging (fMRI and MEG/EEG) in particular. Linear and non-linear regression analysis is treated, as well as confidence intervals and significance testing. The goal of the course is to provide insight into the theory of parameter estimation and to develop a critical attitude towards its application and interpretation in order to avoid inconsistent and improper use of the theory.

Inhoud vak

Linear-non linear parameter models, basic matrix-vector algebra, maximum likelihood principle, correlated-uncorrelated noise, OLS, GLS, data outliers, nuisance parameters, linear (time invariant) filters, t-test, F-test, confidence intervals, fMRI data model, missing data, MEG/EEG source localisation. These topics are treated in the form of a series of lectures alternated with exercises.

Extra topics: L1 en L2 norms.

Onderwijsvorm

Lecture and MatLab exercises.

Toetsvorm

Written exam plus bonus point for critical review of scientific paper.

Literatuur

A syllabus and slides will be provided by the lecturer.

Aanbevolen voorkennis

Some Matlab experience is recommended.

Doelgroep

mMNS

Particle Cosmology

Vakcode	XMU_420560 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Niveau	400

Inhoud vak

The course description is available on

<http://studiegids.uva.nl/xmlpages/page/2015-2016/zoek-vak/vak/14319>

Overige informatie

This course is offered at the UvA. For more information contact: FNWI

Education Service Centre, Science Park 904, servicedesk-esc-
science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Particle Detection

Vakcode	XMU_420051 (420051)
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H.J. Bulten
Examinator	dr. H.J. Bulten
Lesmethode(n)	Hoorcollege
Niveau	500

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2015-2016/zoek-vak/vak/14975>

Overige informatie

This course is offered at the UvA. For more information contact: FNWI

Education Service Centre, Science Park 904,
servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Particle Physics I

Vakcode	XMU_420052 (420052)
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H.J. Bulten
Examinator	dr. H.J. Bulten
Niveau	400

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2015-2016/zoek-vak/vak/14921>

Overige informatie

This course is offered at the UvA. For more information contact: FNWI

Education Service Centre, Science Park 904,

servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Particle Physics II

Vakcode	XMU_420053 (420053)
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H.J. Bulten
Examinator	dr. H.J. Bulten
Niveau	500

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017/zoek-vak>

Doelgroep

mPhys-PPAP, mPhys-TP

Overige informatie

Opgave via <https://www.sis.uva.nl> tot 4 weken voor aanvang van het semester is verplicht

Course registration at the UVA is compulsory at least 4 weeks before the start of the semester via <https://www.sis.uva.nl>

Particles and Fields

Vakcode	XMU_420112 (420112)
Periode	Periode 4+5
Credits	6.0
Voertaal	Engels

Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H.J. Bulten
Examinator	dr. H.J. Bulten
Lesmethode(n)	Hoorcollege
Niveau	500

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017/zoek-vak>

Doelgroep

mPhys-TP, mPhys-PPAP

Overige informatie

This course is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

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.

Photosynthesis and Energy

Vakcode	X_422553 (422553)
Periode	Periode 5
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. I.H.M. van Stokkum
Examinator	dr. I.H.M. van Stokkum
Docent(en)	dr. I.H.M. van Stokkum
Lesmethode(n)	Hoorcollege
Niveau	500

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017-en/search-course>

Overige informatie

This course is part of the MSc Physics and Astronomy (joint degree) and is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Photovoltaics

Vakcode	XMU_428516 (428516)
Periode	Periode 4
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Niveau	400

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017-en/search-course>

Overige informatie

This course is part of the MSc Physics and Astronomy (joint degree) and is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Physics of Organs 2: Sensory Organs and Bioelectricity

Vakcode	XMU_428528 (428528)
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Lesmethode(n)	Hoorcollege
Niveau	400

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017/zoek-vak/vak/22975>

Overige informatie

This course is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

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 instituutsopleiding. De werkplekbegeleider is op de hoogte van de onderwerpen die op de instituutdag gebruikt worden en gebruikt dezelfde rubric als de instituutsopleiders 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 instituutsopleiding. 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 blikken 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 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. 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 ()
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. 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)	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.

Principles of Pharmaceutical Sciences / Pharmacochimistry

Vakcode	X_435675 (435675)
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. I.J.P. de Esch
Examinator	prof. dr. I.J.P. de Esch
Docent(en)	prof. dr. I.J.P. de Esch
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak

General introduction into and deepening of knowledge of concepts, mechanisms and recent developments in pharmaceutical sciences and the pharmaceutical and biotech industry.

Inhoud vak

This course is designed for students with an interest in life sciences and the biotech/pharmaceutical industry but without prior education in this field. A general introduction will be given to the process of drug discovery, drug design and synthesis, drug development and drug safety assessment. Subsequently, potential drug targets, mechanisms of drug actions (including drug-receptor/enzyme Using various drug classes, relationships between chemical structures and biological activities will be derived and illustrated. Finally, various modern developments and tools will be illustrated by recent applications in the field of drug research, medicinal chemistry and toxicology.

Onderwijsvorm

Lectures and tutorials.

Toetsvorm

Written examination

Literatuur

Patrick, G., An Introduction to Medicinal Chemistry 5th ed.
Oxford: Oxford University Press. 2009, ISBN: 978-0-19-969739-7

Doelgroep

3S, 3MNW, mCh, mPhys.

The course is optional for mDDS students that did not follow the VU University BSc Pharmaceutical sciences and these mDDS students should contact the mDDS coordinator before enrolling.

The course is recommended for SBI (life) mastertrack students, except for students with an bachelor in SBI or pharmaceutical sciences.

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.

Programming C++

Vakcode	XMU_420141 (420141)
Periode	Periode 3
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H.J. Bulten
Examinator	dr. H.J. Bulten
Niveau	400

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017/zoek-vak>

Overige informatie

This course is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Project Sustainable Future

Vakcode	X_432784 ()
Periode	Periode 6
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J.C. Slootweg
Examinator	dr. J.C. Slootweg
Lesmethode(n)	Hoorcollege, Werkcollege
Niveau	500

Protein Science

Vakcode	AM_470145 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. D. Bald
Examinator	dr. D. Bald
Docent(en)	dr. M.H. Siderius, dr. J.N.M. Commandeur, dr. D. Bald, dr. ir. K.A. Feenstra, prof. dr. M.J. Smit, dr. D.P. Geerke, prof. dr. ir. E.J.G. Peterman
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	400

Doel vak

The student:

1. knows and understands principles of protein structure, dynamics, regulation, inhibition, interaction and engineering
2. can explain protein function based on protein structure and the properties of amino acid residues.
3. can predict the function of (parts of) a protein based on understanding of its molecular properties
4. knows and understands the principle of current methods for protein investigation (e.g. overproduction, purification, interaction, engineering)
5. can analyze the strong and weak points of Protein Science techniques and can correlate an open question with a suitable technique.
6. can analyze experiments in Protein Science and design new experiments.

Inhoud vak

We will start with a repetition of protein structure and function. Subsequently, we will focus on methods in protein science and also on more specialized properties of proteins important in fundamental research, biomedicine or biotechnology. Finally we will deal with case studies on selected proteins.

Lecture topics include:

Protein Structure, Protein Function, Protein Dynamics, Molecular Machines, Control of Protein Function, Protein inhibition, Antibiotic action, Development of antibiotics and antibiotic resistance, Protein over-expression and purification, Protein Interaction, Protein Engineering,

Molecular Modeling and docking

Case studies:

GPCRs as drug target, Cytochrome P450, Chaperones as Protein folding machines, Molecular Modeling/docking.

Onderwijsvorm

Lectures (30 h) accompanied by work (paper) discussions (6 h) and self study

(individual or in small groups) to prepare for the lectures and to discuss the material presented in lectures/accompanying papers.

Toetsvorm

Written exam (100%)

Literatuur

No special book required. Useful may be "Protein Structure and Function" by Petsko/Ringe. You can also use any Biochemistry textbook (e.g. Voet and Voet) for repetition. You will receive material (reviews and original articles on relevant topics). Examples of scientific literature: Lee et al. Nature 2010, Bax et al. Nature 2010, and Kumar Exp. Opin. Drug Metab 2010.

Doelgroep

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

Overige informatie

Visiting lecturer: Dr. Anil Koul, Tibotec J&J

Quantum Field Theory

Vakcode	XMU_420081 (420081)
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Docent(en)	prof. dr. P.J.G. Mulders
Lesmethode(n)	Hoorcollege
Niveau	400

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017/zoek-vak>

Aanbevolen voorkennis

Advanced Quantum Mechanics (VU) or Quantum 3 (UvA).

Doelgroep

Overige informatie

This course is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Quantum Field Theory - Extension

Vakcode	XMU_422554 (422554)
Periode	Periode 3
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Docent(en)	prof. dr. P.J.G. Mulders
Lesmethode(n)	Hoorcollege
Niveau	500

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017/zoek-vak/vak/23677>

Overige informatie

This course is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Quantum optics

Vakcode	XMU_428535 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Niveau	400

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017-en/search-course>

Overige informatie

This course is part of the MSc Chemistry (joint degree) and is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

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

Researching science research

Vakcode	X_432849 ()
Periode	Periode 4+5
Credits	12.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. ir. B.A.G. Bossink
Examinator	prof. dr. ir. B.A.G. Bossink
Docent(en)	prof. dr. ir. B.A.G. Bossink
Lesmethode(n)	Werkcollege
Niveau	500

Doel vak

To study strategy, structure, culture and the environment of a lab research group or R&D group in practice. Students learn how a lab research group or R&D group in life & health practice or energy & sustainability practice functions, on a daily basis, on a yearly basis, related to other commercial functions in its direct environment, and related to the strategy of the organization in which it is situated.

Inhoud vak

Road mapping-assignment to study strategy, structure, culture and environment of a lab research group or R&D group in life & health practice or energy & sustainability practice.

- Students learn to develop a case study research plan that enables them to study a lab or R&D group in practice
- Students learn to carry out the planned case study research steps
- Students develop an report in which they describe and discuss strategy, structure, culture of a lab research or R&D group in practice
- Students learn to orally present and discuss their finding with a student-audience.

Onderwijsvorm

- Weekly interactive assignment sessions;
- Plenary presentation sessions;

Toetsvorm

Students work on an assignment and write a report on the functioning of a lab group or R&D group they studied by means of a case study research method. The assignment is related to 12 EC of the track courses a student has chosen in his/her personal education plan. To pass a weighted average of 5.5 or higher should be scored for the assignment (60%) and presentations (40%).

Literatuur

To be announced on blackboard.

Vereiste voorkennis

12 EC of science courses

Doelgroep

Master SBI, track Life & Health and Energy & Sustainability

SBI Project & Master Thesis

Vakcode	X_432735 ()
Periode	Ac. Jaar (september)
Credits	36.0
Voertaal	Nederlands
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	E.H. Kroezinga
Examinator	prof. dr. ir. B.A.G. Bossink
Docent(en)	prof. dr. ir. B.A.G. Bossink
Lesmethode(n)	Hoorcollege
Niveau	600

Doel vak

The aim of the Master project is that the individual student learns to conduct a comprehensive SBI research project.

Inhoud vak

Further deepening and application of knowledge and skills that are obtained during the bachelor and master program. The project starts with developing a project plan. The plan consists of: literature study,

research questions, research methods and techniques, time schedule and research goals. The project starts when the plan is approved by the supervisors from VU University and the supervisor from the organization in which the student conducts the research project. The research project lasts for five to six months, and is centered around a SBI-related problem that is acknowledged by the student and the supervisors. The student produces two deliverables:

- a. A thesis, consisting of scientific research design, results, discussion, and conclusions.
- b. A report describing the organization in which the project is conducted.

Onderwijsvorm

For further information see Manual Master project SBI (Blackboard). Student will spend most of his/her time on conducting the research project and writing the thesis. Additionally, some time will also be spent on contributing to practical work in the organization that enables the research project. Internship, thesis, final presentation

Toetsvorm

Work execution: 40%
 Aptitude test (the thesis): 45%
 Final oral presentation: 15%

Literatuur

Verschuren, P., Doorewaard, H. (most recent edition) Designing a research project. The Hague: Eleven International Publishing.

Other literature as described in the plan of action.

Vereiste voorkennis

Up-to-date PEP signed by the master coordinator and the examination board. Maximum of 12 EC open, master project excluded, at the start of the internship.

Doelgroep

2 M SBI

Overige informatie

A mandatory part of the Master project is the writing of a reflection report. This reflection consists of two parts: a business analysis and self-reflection. The student has to write the report when the internship is (almost) completed.

SBI Research Methodology

Vakcode	X_432846 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. P.C. van der Sijde
Examinator	prof. dr. P.C. van der Sijde
Lesmethode(n)	Hoorcollege
Niveau	500

Doel vak

The objective of the course is to learn about the different methodological traditions in science. SBI is a multidisciplinary study in which (natural) sciences, social and business studies are combined. Each with its own pedigree. The students learn about the similarities and differences and how to cope with methodological issues in their research projects.

Inhoud vak

The students are introduced to the different methodological traditions (- natural - sciences, social and business studies) and learn about what it means to do research. Students learn to analyze articles, formulate research question, qualitative and quantitative research, setting up research and analyzing data.

Onderwijsvorm

The course has two parts:

Part 1 - classes and workgroups. theory is introduced in the classes and via assignment elaborated in work groups.

Part 2 - the students coach Bachelorstudents in writing their Plan of Action for the Bachelorthesis.

Toetsvorm

1. Exam (30%)
2. Research plan for a project (50%)
3. Reflection report of the coaching of Bachelor students (20%)

Literatuur

Bhattachjee, A. (2012) Social science research. (Available via Internet)
Selected articles to be announced

Doelgroep

SBI students preparing for their thesisproject

Intekenprocedure

via the normal procedures

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 and Society in Historical Perspective

Vakcode	X_400424 (400424)
Periode	Periode 4+5
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. D.J. Beckers
Examinator	dr. D.J. Beckers
Docent(en)	dr. D.J. Beckers
Lesmethode(n)	Hoorcollege, Werkcollege
Niveau	400

Doel vak

To increase understanding of the various interactions between mathematics, chemistry, physics, (medical) biology, computer and earth sciences (in general: science) and society during the last two centuries.

Inhoud vak

In the last two centuries science has become one of the prime agents in the shaping of modern society. In turn social and political concerns have been equally instrumental in the shaping of the modern scientific enterprise. In this course we will study the changing relationship between science and society in this period in various case studies and from several points of view. We will use literature and source material, most notably (journal and film) advertisements, and the cartoon journal Punch to illustrate these cases. The following themes are addressed: professionalization, science and the public (e.g. the public understanding and appreciation of science); Science as product and agent of modernity (e.g. quantification and standardization as applied to nature and society); Science and politics (e.g. science policies, military and commercial interests, science and ideology), science and education.

Onderwijsvorm

Seminar.

Toetsvorm

Active participation during the seminar, essay and presentation and a short exam on the topics addressed during the classes.

Literatuur

available via blackboard.

Vereiste voorkennis

Bachelor degree

Doelgroep

Master students in the sciences who enjoy history or (historical) reflection on their field of subject, as well as master students in history, who want to acquire more understanding in the role of science in society.

Overige informatie

More information with the course coordinator: Afdeling Algemene Vorming, De Boelelaan 1081, kamer U252, d.j.beckers@vu.nl

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 in Perspective

Vakcode	XMU_437030 ()
Periode	Periode 4+5
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Niveau	400

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017/zoek-vak>

Overige informatie

This course is part of the MSc Chemistry (joint degree) and is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100. Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

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.

Science project

Vakcode	XM_422591 ()
Periode	Ac. Jaar (september)
Credits	24.0
Voertaal	Nederlands
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J.P. Dekker
Examinator	dr. J.P. Dekker
Niveau	400

Doel vak

The MSc SBI students will follow the Science Project SBI to strengthen their knowledge and experience with natural sciences in order to be able to talk the language of the specialists and to scan and interpret new developments and inventions in the field of life and health and/or energy and sustainability. The student will:

- a. actively participate in a research team and is expected to critically follow and discuss research matters that are a subject in meetings as well as present his or her own work to the group on a regular basis. In doing so and through this immersion in faculty research, the student is becoming acquainted with a research process, including its organization, objectives and challenges.
- b. design, execute and deliver his or her own research project and be individually responsible for it, under supervision of a senior scientist. A second and independent reviewer will be assigned to assess the final products.
- c. deliver a final report, present outcomes on a regular basis including a final presentation and make detailed recommendations for further research with respect to his or her research assignment.

Inhoud vak

In this project the student should work closely with laboratory researchers on a project based on modeling and/or experimental lab work. Programs that contain innovation or valorization aspects are ideally suited for participation of SBI students. Once a topic has been agreed upon, the student will agree on a research question. Subsequently the student will draft a research plan in which is addressed: theoretical framework, research methodology and data analysis, experimentation set-up, planning, organization, anticipated outcomes and reporting format. This plan will also include a listing of some relevant literature references pertaining to the particular topic.

The plan may also include a course to provide insight and experience on experimental lab work or modeling. For instance, it is possible to define a drug discovery project that is accompanied by the integrated course Computational Design and Synthesis of Drugs (code 435673). In this course, students will learn step by step about data mining and computer-aided drug design techniques. The study load of these courses will be integrated in the Science Project SBI.

Onderwijsvorm

Research project

Toetsvorm

Report and presentation, as explained in the course manual

Literatuur

Depending on the project

Vereiste voorkennis

Requirements to enter the mSBI program

Doelgroep

mSBI

Scientific Writing in English

Vakcode	X_400592 (400592)
Periode	Periode 2, Periode 6
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	M. van den Hoorn
Examinator	M. van den Hoorn
Lesmethode(n)	Hoorcollege
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 2 contact hours a week. 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, 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.

Doelgroep

This course is only open to students of the two-year Master's programmes of the Faculty of 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.

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.

Showcase 1

Vakcode	XMU_428576 ()
Periode	Periode 1
Credits	0.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Niveau	400

Showcase 2

Vakcode	X_422609 ()
Periode	Periode 2
Credits	0.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Docent(en)	dr. H.L. Bethlem
Lesmethode(n)	Hoorcollege
Niveau	400

Societal entrepreneurship in health and life sciences

Vakcode	AM_470575 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	L.H.M. van de Burgwal MSc
Examinator	L.H.M. van de Burgwal MSc
Docent(en)	prof. dr. H.J.H.M. Claassen, prof. dr. E. Masurel
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	500

Doel vak

This course focuses on societal aspects of entrepreneurship. During the course you study the meaning of societal and responsible entrepreneurship in a concrete setting. In the course theoretical insights are combined with practical knowledge regarding business plans. Lecturers from Athena and experts from the field discuss various relevant topics, such as: the main elements of a business plan, how to write an executive summary, the role of societal impact, and elements of CSR. The course is relevant for a wide range of business cases in the health and life sciences, ranging from starting an NGO-like organization, to starting a strong business-driven life sciences corporation.

This course is thus intended for students that have truly considered becoming entrepreneurs themselves. To this end, we specifically encourage students to formulate a business case (as a group of 3 students) before registering for this course.

Learning objectives

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

Inhoud vak

This course consists of both a theoretical and a practical component. Both components run simultaneously so that the theoretical knowledge can be applied to the development of the business plan. In the theoretical component you learn about societal entrepreneurship. We address questions such as: What is entrepreneurship? What are societal

entrepreneurs? What is the role of innovation in entrepreneurship? What is corporate social responsibility (CSR)? How can we judge the feasibility of entrepreneurial ambitions?

The practical comment focuses on creating a business plan based on a real-life business case. Based on the Business Model Canvas (Osterwalder & Pigneur, 2010) you develop a business plan covering aspects such as value propositions, key activities, key partners, customer segments, cost structure, and revenue streams. In setting up this business plan, societal aspects of entrepreneurship should play a key role. A jury of financiers judges the business plans on creativity and feasibility.

Onderwijsvorm

Lectures and workshops are key elements of this course. Each week several lectures are given. These lectures provide key knowledge for both the exam and the business plan. Additionally, each week students have workshops in which specific parts of the business plan are further developed. Attending the workshops is compulsory.

Schedule and study time

The total study time is 160 hours. The following hours are contact hours:

- lectures: 42 hours
- workshops: 14 hours
- exam: 3 hours
- writing business plan: 70 hours
- self-study for remaining hours

Toetsvorm

Both the exam and the business plan determine 50% of the grade each. The exam and business plan must be of sufficient quality to pass the course.

Literatuur

To be announced on Blackboard

Doelgroep

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

Overige informatie

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

Statistical Data Analysis

Vakcode	XMU_420067 (420067)
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Niveau	400

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2015-2016/zoek-vak/vak/14976>

Overige informatie

This course is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100. Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Statistical Physics and Condensed Matter Theory I

Vakcode	XMU_420083 (420083)
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Niveau	400

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017/zoek-vak>

Overige informatie

This course is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100. Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Statistical Physics and Condensed Matter Theory I - Extension

Vakcode	XMU_428519 (428519)
Periode	Periode 3
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Niveau	500

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2015-2016/zoek-vak/vak/22444>

Overige informatie

This course is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100. Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Statistical Physics and Condensed Matter Theory II

Vakcode	XMU_420100 (420100)
Periode	Periode 4+5+6
Credits	6.0
Voertaal	Engels

Faculteit	Faculteit der Exacte Wetenschappen
Lesmethode(n)	Hoorcollege
Niveau	500

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017/zoek-vak>

Overige informatie

This course is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Stochastic Simulation

Vakcode	XMU_428577 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Niveau	400

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2015-2016/zoek-vak/vak/15356>

Intekenprocedure

Registration is required via <https://www.sis.uva.nl> before the start of the semester. Please visit the website of your programme through <http://student.uva.nl> and check the A-Z list 'Course and Exam Registration' for more information.

String Theory

Vakcode	XMU_400242 (400242)
Periode	Periode 5
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Lesmethode(n)	Hoorcollege
Niveau	500

Inhoud vak

The course description is available on:

<http://studiegids.uva.nl/xmlpages/page/2015-2016/zoek-vak/vak/14988>

Overige informatie

This course is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Strong Interactions 1

Vakcode	X_420233 (420233)
Periode	Periode 4
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Lesmethode(n)	Hoorcollege
Niveau	400

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017-en/search-course>

Overige informatie

This course is part of the MSc Physics and Astronomy (joint degree) and is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Strong Interactions 2

Vakcode	XME_420234 (420234)
Periode	Periode 5
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Lesmethode(n)	Hoorcollege
Niveau	500

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017-en/search-course>

Doelgroep

mPhys-PPAP, mPhys-TP

Overige informatie

This course is part of the MSc Physics and Astronomy (joint degree) and is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Student Seminar Theoretical Physics

Vakcode	XMU_420200 (420200)
Periode	Periode 6
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Lesmethode(n)	Hoorcollege
Niveau	500

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017/zoek-vak>

Overige informatie

This course is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Superconductivity

Vakcode	XMU_428522 (428522)
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Lesmethode(n)	Hoorcollege
Niveau	500

Inhoud vak

The course description is; available on

<http://studiegids.uva.nl/xmlpages/page/2015-2016/zoek-vak/vak/20497>

Overige informatie

This course is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100.

Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Technology and Innovation Processes

Vakcode	E_BA_TIP ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Economische Wet. en Bedrijfsk.
Coördinator	dr. P.R. Tuertscher
Examinator	dr. P.R. Tuertscher
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	400

Doel vak

After finishing this course, students will be able to:

- Explain challenges, concepts, and theories related to processes of technological innovation
- Apply concepts and theories to analyze real life cases and develop solutions to improve innovation processes
- Critically reflect upon theoretical assumptions and methodological approaches in research on technology and innovation

Inhoud vak

This course is about processes of technological innovation within and between organizations. In short, this course concerns the creation of innovative ideas and their conversion into products and services that have value for a company and its customers. This course helps students to understand and improve the complex and uncertain process of technological innovation. Topics that will be addressed include the evolution of technology, collaborative innovation, uncertainty and learning, business model innovation, the role of the institutional contexts, and timing in innovation processes. The course will focus on specific fields of technology: energy, information technology, life sciences / biotech, and semiconductors.

Onderwijsvorm

The course will consist of a combination of interactive lectures (6), seminars (6), and assignments. The lectures will also include a critical discussion of selected readings, stimulated by obligatory individual reflections on this literature. The seminars will be used to have groups of students present and discuss assignments.

Toetsvorm

Students will be graded based upon three types of assignments:

- Individual reflections on literature
- Group assignments based on real life cases
- Final group assignment in which theoretical perspectives have to be applied to a specific technological innovation

Literatuur

A collection of scientific articles, to be announced on Blackboard.

Aanbevolen voorkennis

Basic knowledge of innovation management and organization studies

Transdisciplinarity and Transition

Vakcode	X_430604 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. O.E. Popa
Examinator	dr. O.E. Popa
Docent(en)	dr. B.J. Regeer, prof. dr. J.T. de Cock Buning
Lesmethode(n)	Hoorcollege, Werkcollege, Deeltoets extra zaalcapaciteit, Werkgroep
Niveau	400

Doel vak

- You can reproduce and apply the essence of current transition theories, e.g. the multi-level perspective.
- You can design a tailor made transdisciplinary approach to identify and cope with hurdles in an innovation trajectory, based on amongst others the Interactive Learning and Action approach.
- You are able to make an in-depth semi-structured interview guide.
- You are able to execute, transcribe, analyse and summarise an in-depth

interview.

- You are able to apply analytical tools, such as causal analysis, actor analysis, fact-value framing, SWOT.
- You are able to integrate multi-disciplinary knowledge and multi-stakeholder interests into a management advice for a transition process.

Inhoud vak

Innovation often implies a troublesome and risky process starting with a bright idea, via a small niche innovation towards a competitive position. This course focuses on the analytical skills necessary to guide and advise a niche innovation.

Guiding and advising implies that you are aware of the social forces prohibiting a breakthrough and how to identify and implement tailor made solutions to deal with these forces. Therefore, this course introduces you to several theories related to innovation and societal forces, and we will offer you training with a toolbox of various analytical methods to explore the specific hurdles of a given project, in order to design a tailor made advice.

Little by little, academic research reveals the complexity of societal mechanisms behind transitions, e.g., cultural aspects, psychological aspects, structures of states, institutions and multinationals.

Transdisciplinarity is an emerging discipline in which research approaches and analytical methods are developed to connect relevant parts of different disciplines to solve complex processes, including transitions. Transitions are referred to as complex because different stakeholder groups are involved (e.g. industry, academia, consumers and NGOs) and these stakeholders often have different visions on what is "best" for society.

On the basis of experiences with large innovative consortia (Genomic Initiative - ecological genomics, Sustainable innovation/brain imaging, BE-Basic/synthetic biology) you will learn all about the do's and don'ts of the Interactive learning and Action approach, how to use an actor analysis to delineate your allies and enemies, how to use semi-structured interviews to deepen your understanding of reasons behind problems, how to construct a causal analysis to understand the complexity of the problems you face, and how a SWOT analysis can help to identify strategic priorities.

Parallel to the lectures you will work in a group on an advice regarding an innovation, conducting interviews with key players and analysing the complexity of interests.

Onderwijsvorm

Lectures, skills training, coach meetings, self-study and project
The total study time is 6 EC (6x28 = 168 hours). Tuition methods include lectures, training sessions, self-study, and a group project on a specific case. In the case study, you will integrate different theories and tools, and apply the toolbox introduced during the lectures.

- lectures: 12 hours
- coach meetings: 16 hours
- skills training: 6 hours
- execution of 2 interviews: 2 hours
- execution of expert meeting: 2 hours
- presentation of project results: 4 hours
- self study and project: 124 hours
- examination: 2 hours (two mini-exams of 60 minutes)

Please note that attendance to the project meetings (coach meetings and skills training) is compulsory. Attendance to the lectures is highly recommended since relying on self-study alone has proven to be

insufficient to pass the mini-exams. For the group project, you will make rules with your group during the first meeting with your coach.

Toetsvorm

The course grade is based on the project (group and individual) and the exam. All aspects (including both mini-exams) have to be concluded with the grade of 5.5 or higher.

Team project report (40%)

Team project presentation (10%)

Individual attitude and skills assessment (20%)

2 individual written mini-exams (30%)

Resits for the mini-exams will be organized in the first resit period after the end of the course (February).

Literatuur

Book: Biotechnology and Food

Articles are made available via Blackboard

Vereiste voorkennis

Proven knowledge of organisations and management and business is required

Doelgroep

Master students SBI track (mCh)

Intekenprocedure

As the number of participants will dictate the number of different projects (and the related team coaches), the deadline for VU-net registration will be 4 weeks before the start of the course. Retracting your registration for the course after the deadline will have detrimental effects on the composition of the teams, the network of contacted interviewees and contracted coaches.

Overige informatie

This course mimics the world of a transition task-force. This implies 100% use of the available time (=20 hours a week) to accomplish all the necessary steps in conceptualisation of the complexity, data collection, interviews, analysis, validation of preliminary result with external experts, and finally presenting your change strategy. You will need to use and integrate all knowledge you acquired before.

Tutoring Students

Vakcode	X_432625 (432625)
Periode	Periode 2
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M. Wijtmans
Examinator	dr. M. Wijtmans
Docent(en)	dr. M. Wijtmans, dr. H.B. Westbroek
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak

This course aims to prepare students for coaching tasks in tutorials and practical courses. Students will encounter aspects of teacher-student interaction, including several models that are involved in the coaching process.

Inhoud vak

The course contains various topics and activities. Students make an analysis of various learning aims as well as prepare, conduct and reflect on a presentation of a pre and post discussion regarding tutorials and practical courses. They will observe and interpret the application of problem solving and coaching models in tutorials and practical courses. Attention will be paid to strengths and weaknesses in models of teacher-student interaction. An important constituent is the student's analysis of his/her own pattern of communication. Topics on safety and lab journal procedures in practical courses as well as on the grading of lab reports are also included.

Onderwijsvorm

4 consecutive hours per week (seven weeks long):

- Lectures
- Simulations
- Self-study
- Group work

Toetsvorm

- An essay on the strengths and weaknesses in a model of teacher-student interaction.
- A learning report on presentations concerning predict, observe, explain in practical work.
- A written analysis on grading lab reports.
- A written feedback on the planning of and enactment in tutorials.

Literatuur

Will be provided.

Doelgroep

mDDS

Intekenprocedure

VUnet

Overige informatie

This course is compulsory for MSc students who become assistants in practical courses and tutorials in the department of Chemistry and Pharmaceutical Sciences. Moreover, the course is recommendable for any MSc student who has a general interest in educational coaching strategies and models.

Number of participants is limited to 24 (first-come, first-serve basis).

Ultrafast Laser Physics

Vakcode	X_422556 (422556)
Periode	Periode 4
Credits	6.0

Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. K.S.E. Eikema
Examinator	prof. dr. K.S.E. Eikema
Docent(en)	prof. dr. K.S.E. Eikema
Lesmethode(n)	Hoorcollege
Niveau	400

Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2016-2017-en/search-course>

Overige informatie

This course is part of the MSc Chemistry (joint degree) and is offered at the UvA. For more information contact: FNWI Education Service Centre, Science Park 904, servicedesk-esc-science@uva.nl, +31 (0)20 525 7100. Enrolment via <https://m.sis.uva.nl/vakaanmelden> is required.

Wetenschapscommunicatie voor Bèta-onderzoekers

Vakcode	AB_470185 ()
Periode	Periode 5
Credits	6.0
Voertaal	Nederlands
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. J.F.H. Kupper
Examinator	dr. J.F.H. Kupper
Docent(en)	dr. B.J. Regeer, dr. J.F.H. Kupper, drs. ir. M.G. van der Meij
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	200

Doel vak

- Introductie in het vakgebied wetenschapscommunicatie
- Verwerven van kennis en inzicht in de dynamische relatie tussen wetenschap en maatschappij
- Verwerven van inzicht in verschillende belangen en perspectieven van betrokken partijen in wetenschapscommunicatie
- Verwerven van inzicht in de rol van wetenschapscommunicatie in de relatie tussen wetenschap en maatschappij
- Verwerven van inzicht in communicatiestrategieën, doelgroepen en media in wetenschapscommunicatie
- Ontwikkeling van praktische vaardigheden voor wetenschapscommunicatie (schrijven, presenteren, discussiëren)
- Het opdoen van ervaring in een multidisciplinaire groep.

Inhoud vak

Wetenschap heeft verstrekkende gevolgen voor de maatschappij (bv. biotechnologie, neurowetenschappen, farmaceutische industrie). Maar hoe kijkt de maatschappij eigenlijk naar wetenschappelijke ontwikkelingen? Wat vindt de industrie van nieuwe wetenschappelijke inzichten? Hoe reageren maatschappelijke organisaties of het brede publiek? Deze

maatschappelijke visies hebben een grote invloed op de richting die het onderzoek in de nabije toekomst gaat nemen. Daarom is communicatie over wetenschap van cruciaal belang.

In deze cursus raak je vertrouwt met een aantal modellen van wetenschapscommunicatie, het herkennen van hun toepassingen in de praktijk en de verschillende soorten publiek die men ermee kan aanspreken (populariseren voor leken, informatieoverdracht voor de industrie, faciliteren van interdisciplinair onderzoek in de wetenschap, participatie van burgers en patiënten in onderzoek). Door middel van opdrachten raak je bekend met de praktische kant van wetenschapscommunicatie, bijvoorbeeld wetenschapsjournalistiek, voorlichting, dialogen en debatten, etc. De opdrachten worden deels individueel uitgevoerd en deels in een groep.

Onderwijsvorm

Colleges 15 uur

Zelfstudie en tentamen 70 uur

Werkcolleges 15 uur

Opdrachten 60 uur

Toetsvorm

Individuele toetsing bestaat uit:

- Schriftelijk tentamen (50%)

- groepsopdrachten (25%)

- individuele opdrachten (25%)

Alle onderdelen moeten met een voldoende worden afgesloten.

Literatuur

Literatuur wordt aangeboden via Blackboard en een maand voor de cursus bekendgemaakt.

Doelgroep

Keuzecursus voor tweedejaars en derdejaars BSc Biomedische Wetenschappen en Biologie en BSc. Gezondheid en Leven. Ook te volgen voor de Bsc binnen Aardwetenschappen en Exacte Wetenschappen. Speciaal aanbevolen voor studenten die overwegen de C-variant (wetenschapscommunicatie) of M-variant (beleid en management) in hun masterprogramma op te nemen.

Overige informatie

We werken met enkele gastsprekers die een maand voor de cursus bekend zullen zijn.