



Drug Discovery & Safety MSc

Vrije Universiteit Amsterdam - Faculteit der Exacte Wetenschappen - M Drug Discovery and Safety - 2014-2015

Specializations

During the Master's in Drug Discovery and Safety students can specialize themselves by doing a Major in one of the following disciplines:

- Drug Discovery & Target Finding (Molecular Pharmacology)
- Drug Disposition & Safety Assessment (Molecular Toxicology)
- Drug Design & Synthesis
- Computational Medicinal Chemistry & Toxicology
- Biomarkers & Clinical Chemical Analysis

Variants

The Master programme Drug Discovery and Safety offers four different variants for graduation:

- Research variant (O-variant)
- Society oriented variant for natural and life sciences (M-variant)
- Communication variant (C-variant)
- Education variant (E-variant)

Global Composition of Master Programme

Variant	O	M	C	E
Compulsory courses	36-42*	30	30	30
Research project (Major) including report	42	24	24	24
Colloquium and Thesis	12	6	6	6
Practical training (company training)	-	30	30	-
M or C projects	-	18	12	-
Educational training	-	-	-	60
Optional programme	24-30*	12	18	-
Ethics and portfolio academic skills	6	-	-	-
Total EC	120	120	120	120

Ad *) Depends on the specialization: Biomarkers & Clinical Analysis requires 42 EC compulsory courses with 24 EC optional programme, other specializations require 36 EC compulsory courses with 30 EC optional programme.

In order to start a minor or major research project or a company training or an internship abroad, at least 18 EC of the Master's programme should be obtained. Upon recommendation from the Master's coordinator, the examination board may also require that a specific course has been completed successfully within the mentioned 18 EC.

Students should arrange the composition of their Master's programme in consult with the Master's coordinator. The examination board formally has to approve the composition and extent of the Master's programme.

[Master co-ordinators](#)

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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 Chemistry courses.

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

Opleidingsdelen:

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

Optional courses: select at least 12EC

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

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

Vakken:

Naam	Periode	Credits	Code
Communication, Organization and Management	Periode 2	6.0	AM_470572
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

DDS courses

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.

To complete the entire Master programme (120 credits) of the Communication, education or social variant, the student has to choose 60 credits in DDS courses.

Opleidingsdelen:

- [Specialisation Courses](#)
- [Literature and Colloquium \(compulsory choose 1 of 5\)](#)
- [DDS Research project \(choose 1 of 5\) \(24 EC\)](#)
- [Deficiency Courses](#)

Specialisation Courses

In consultation with the master coordinator and depending of the chosen specialization 6 credits have to be chosen from the following list.

Vakken:

Naam	Periode	Credits	Code
ADMET	Periode 1	6.0	X_432721
Biomolecular Simulation in Medicinal Chemistry and Toxicology	Periode 5+6	6.0	X_432664
Chemical Biology	Periode 1	6.0	X_432538
Computer-Aided Drug Design and Virtual Screening	Periode 2	6.0	X_432673
Drug Action	Periode 3	6.0	X_432724
Drug-induced Stress and Cellular Responses	Periode 2	6.0	X_432536
Mass Spectrometry	Periode 2	6.0	X_435604
Physical-Organic Chemistry	Periode 1	6.0	X_435663
Project Computational Design and Synthesis of Drugs	Periode 4	6.0	X_432734
Signal Transduction in Health and Disease	Periode 2	6.0	X_432535
Synthetic Approaches in Medicinal Chemistry	Periode 2	6.0	X_435685

Literature and Colloquium (compulsory choose 1 of 5)

Students need to select a total of 6 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
Colloquium and Literature Thesis CMCT (C,E,M)	Ac. Jaar (september)	6.0	X_432571
Colloquium and Literature Thesis DDS BDA (C,E,M)	Ac. Jaar (september)	6.0	X_432570
Colloquium and Literature Thesis DDS MC, DD&S (C,E,M)	Ac. Jaar (september)	6.0	X_432623
Colloquium and Literature Thesis DDS MC, DDTF (C,E,M)	Ac. Jaar (september)	6.0	X_432624
Colloquium and Literature Thesis DDS Molecular Toxicology, DDSA (C,E,M)	Ac. Jaar (september)	6.0	X_432572

DDS Research project (choose 1 of 5) (24 EC)

Students need to select at least 30 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
Major Research Project DDS Biomolecular Drug Analysis (C,E,M)	Ac. Jaar (september)	24.0	X_432727
Major Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	24.0	X_432728
Major Research Project DDS Medicinal Chemistry, DDTF	Ac. Jaar (september)	24.0	X_432729
Major Research Project DDS Molecular Toxicology, CMCT	Ac. Jaar (september)	24.0	X_432730
Major Research Project DDS Molecular Toxicology, DDSA (C,E,M)	Ac. Jaar (september)	24.0	X_432731

Deficiency Courses

Compulsory course for students without a Bachelor degree Pharmaceutical Sciences VU.

Not specified: all courses start with an summary of required knowledge.

Vakken:

Naam	Periode	Credits	Code
Principles of Pharmaceutical Sciences / Pharmacology	Periode 1	6.0	X_435675

Compulsory Courses

Vakken:

Naam	Periode	Credits	Code
Internship Communication Specialisation	Ac. Jaar (september)	30.0	AM_471148
Qualitative and Quantitative Research Methods	Periode 1	6.0	AM_470582
Science and Communication	Periode 1	6.0	AM_470587

Education 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 Chemistry vakken, in overleg met de mastercoördinator van de gekozen specialisatie. Hierbij zijn de twee vakken Literature thesis and Colloquium Chemistry Education Variant en Master Research Project Chemistry-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:

- [Leraar voorbereidend hoger onderwijs in Scheikunde verplicht](#)
- [DDS courses](#)

Leraar voorbereidend hoger onderwijs in Scheikunde verplicht

Vakken:

Naam	Periode	Credits	Code
Algemene didactiek en Pedagogiek I	Periode 1+2, Periode 4+5	6.0	O_MLADEPI
Algemene Didactiek en Pedagogiek II	Periode 1+2, Periode 4+5	3.0	O_MLADEPII
Praktijk I	Periode 1+2+3, Periode 4+5+6	15.0	O_MLPRAKI
Praktijk II	Periode 1+2+3, Periode 4+5+6	15.0	O_MLPRAKII
Professionele ontwikkeling en onderzoek I	Periode 1+2+3, Periode 4+5+6	3.0	O_MLVPOOI
Professionele ontwikkeling en onderzoek II	Periode 1+2+3, Periode 4+5+6	6.0	O_MLVPOOII
Vakdidactiek Scheikunde I	Periode 1+2, Periode 4+5	3.0	O_MLVDSKI
Vakdidactiek Scheikunde II	Periode 1+2, Periode 4+5	6.0	O_MLVDSKII
Verdieping	Periode 2+3, Periode 5+6	3.0	O_MLVERD

DDS courses

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.

To complete the entire Master programme (120 credits) of the Communication, education or social variant, the student has to choose 60 credits in DDS courses.

Opleidingsdelen:

- [Specialisation Courses](#)
- [Literature and Colloquium \(compulsory choose 1 of 5\)](#)
- [DDS Research project \(choose 1 of 5\) \(24 EC\)](#)
- [Deficiency Courses](#)

Specialisation Courses

In consultation with the master coordinator and depending of the choosen specialization 6 credits have to be choosen from the following list.

Vakken:

Naam	Periode	Credits	Code
ADMET	Periode 1	6.0	X_432721
Biomolecular Simulation in Medicinal Chemistry and Toxicology	Periode 5+6	6.0	X_432664
Chemical Biology	Periode 1	6.0	X_432538
Computer-Aided Drug Design and Virtual Screening	Periode 2	6.0	X_432673
Drug Action	Periode 3	6.0	X_432724
Drug-induced Stress and Cellular Responses	Periode 2	6.0	X_432536
Mass Spectrometry	Periode 2	6.0	X_435604
Physical-Organic Chemistry	Periode 1	6.0	X_435663
Project Computational Design and Synthesis of Drugs	Periode 4	6.0	X_432734
Signal Transduction in Health and Disease	Periode 2	6.0	X_432535
Synthetic Approaches in Medicinal Chemistry	Periode 2	6.0	X_435685

Literature and Colloquium (compulsory choose 1 of 5)

Students need to select a total of 6 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
Colloquium and Literature Thesis CMCT (C,E,M)	Ac. Jaar (september)	6.0	X_432571
Colloquium and Literature Thesis DDS BDA (C,E,M)	Ac. Jaar (september)	6.0	X_432570
Colloquium and Literature Thesis DDS MC, DD&S (C,E,M)	Ac. Jaar (september)	6.0	X_432623

Colloquium and Literature Thesis DDS MC, DDTF (C,E,M)	Ac. Jaar (september)	6.0	X_432624
Colloquium and Literature Thesis DDS Molecular Toxicology, DDSA (C,E,M)	Ac. Jaar (september)	6.0	X_432572

DDS Research project (choose 1 of 5) (24 EC)

Students need to select at least 30 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
Major Research Project DDS Biomolecular Drug Analysis (C,E,M)	Ac. Jaar (september)	24.0	X_432727
Major Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	24.0	X_432728
Major Research Project DDS Medicinal Chemistry, DDTF	Ac. Jaar (september)	24.0	X_432729
Major Research Project DDS Molecular Toxicology, CMCT	Ac. Jaar (september)	24.0	X_432730
Major Research Project DDS Molecular Toxicology, DDSA (C,E,M)	Ac. Jaar (september)	24.0	X_432731

Deficiency Courses

Compulsory course for students without a Bachelor degree Pharmaceutical Sciences VU.

Not specified: all courses start with an summary of required knowledge.

Vakken:

Naam	Periode	Credits	Code
Principles of Pharmaceutical Sciences / Pharmacology	Periode 1	6.0	X_435675

Research Variant DDTF

The programme consists of 120 credits

- compulsory courses 36 credits (including a Literature Thesis and Colloquium 12 credits)
- compulsory choice Ethics and Portfolio Academic Skills 6 credits
- compulsory choices Major Research Project at least 42 credits
- optional courses to complete 120 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.

Master Coordinator:

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Opleidingsdelen:

- [Ethics and Academic Skills](#)
- [Deficiency Courses](#)
- [Research project \(choose 42, 48, 54 or 60 EC\)](#)
- [Recommended optional courses](#)
- [Compulsory courses](#)
- [Compulsory courses research master DDS](#)

Ethics and Academic Skills

Students need to select a total of 6 credits 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
Business and Innovation in Life Science	Periode 3	3.0	X_432539
Business Management in Health and Life Sciences	Periode 2	6.0	AM_470584
Clinical development and clinical trials	Periode 3	6.0	AM_470585
Communication, Organization and Management	Periode 2	6.0	AM_470572
Entrepreneurship in Health and Life Sciences	Periode 2	6.0	AM_470575
Ethics and Academic skills	Ac. Jaar (september)	1.0	X_432725
Ethics and Academic skills	Ac. Jaar (september)	2.0	X_432726
Ethics and Academic Skills	Ac. Jaar (september)	6.0	X_437556
Ethics and Academic Skills	Ac. Jaar (september)	3.0	X_432517
Ethics in Life Sciences	Periode 3	3.0	AM_470707

History of Life Sciences	Periode 3	3.0	AM_471017
Managing Science and Technology in Society	Periode 1	6.0	AM_470586
Qualitative and Quantitative Research Methods	Periode 1	6.0	AM_470582
Science and Communication	Periode 1	6.0	AM_470587
Science in Dialogue	Periode 2	6.0	AM_1002
Science Journalism	Periode 2	6.0	AM_471014
Scientific Writing in English	Periode 2, Periode 6	3.0	X_400592
Teaching Assistant	Ac. Jaar (september)	3.0	X_432741
Teaching Assistant	Ac. Jaar (september)	6.0	X_432742
Tutoring Students	Periode 2	3.0	X_432625

Deficiency Courses

Compulsory course for students without a Bachelor degree Pharmaceutical Sciences VU.

Not specified: all courses start with an summary of required knowledge.

Vakken:

Naam	Periode	Credits	Code
Principles of Pharmaceutical Sciences / Pharmacology	Periode 1	6.0	X_435675

Research project (choose 42, 48, 54 or 60 EC)

Compulsory choice of at least 42 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
Major Research Project Med. Chem., Drug Disc. & Target Find.	Ac. Jaar (september)	48.0	X_432550
Major Research Project Med. Chem., Drug Disc. & Target Find.	Ac. Jaar (september)	54.0	X_432551
Major Research Project Med. Chem., Drug Disc. & Target Find.	Ac. Jaar (september)	60.0	X_432552
Major Research Project Med. Chem., Drug Disc. & Target Find.	Ac. Jaar (september)	42.0	X_432547

Recommended optional courses

The subject options of 30, 24, 18 or 12 credits can be completed with the possibilities below.

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 Course on Drug Disp. & Safety Assessment (Mol.Tox.)	Periode 5+6	6.0	X_435681
Applied Theoretical Chemistry	Ac. Jaar (september)	12.0	X_432501
Applied Theoretical Chemistry	Ac. Jaar (september)	6.0	X_435612
Biomolecular Simulation in Medicinal Chemistry and Toxicology	Periode 5+6	6.0	X_432664
Company Training Drug Discovery & Target Finding	Ac. Jaar (september)	18.0	X_432621
Company Training Drug Discovery & Target Finding	Ac. Jaar (september)	24.0	X_432747
Company Training Drug Discovery & Target Finding	Ac. Jaar (september)	30.0	X_432752
Company Training Drug Discovery & Target Finding	Ac. Jaar (september)	36.0	X_432836
Computer-Aided Drug Design and Virtual Screening	Periode 2	6.0	X_432673
Drug-induced Stress and Cellular Responses	Periode 2	6.0	X_432536
Internship abroad DDS Drug Disc. & Target Find.	Ac. Jaar (september)	18.0	X_432678
Internship abroad DDS Drug Disc. & Target Find.	Ac. Jaar (september)	24.0	X_432757
Internship abroad DDS Drug Disc. & Target Find.	Ac. Jaar (september)	30.0	X_432762
Internship abroad DDS Drug Disc. & Target Find.	Ac. Jaar (september)	36.0	X_432840
Mass Spectrometry	Periode 2	6.0	X_435604
Minor Research Project Biomol. Drug Analysis	Ac. Jaar (september)	24.0	X_432658
Minor Research Project Biomol. Drug Analysis	Ac. Jaar (september)	18.0	X_432689
Minor Research Project Biomol. Drug Analysis	Ac. Jaar (september)	30.0	X_432704

Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	18.0	X_432692
Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	24.0	X_432693
Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	30.0	X_432705
Minor Research Project DDS Molecular Toxicology, CMCT	Ac. Jaar (september)	24.0	X_432632
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	24.0	X_432591
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	30.0	X_432592
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	18.0	X_432620
Minor Research Project DDS, CMCT	Ac. Jaar (september)	18.0	X_432507
Minor Research Project DDS, CMCT	Ac. Jaar (september)	30.0	X_432707
Minor Research Project Med. Chem., Drug Disc. & Target Find.	Ac. Jaar (september)	18.0	X_432696
Minor Research Project Med. Chem., Drug Disc. & Target Find.	Ac. Jaar (september)	30.0	X_432706
Minor Research Project Med. Chem., Drug Disc. & Target.Find.	Ac. Jaar (september)	24.0	X_432635
Protein Analysis	Periode 5	6.0	X_435045
Supramolecular Chemistry and Nanomaterials	Periode 1	6.0	X_435653

Compulsory courses

Vakken:

Naam	Periode	Credits	Code
Colloquium and Literature Thesis	Ac. Jaar (september)	12.0	X_432574
High-Throughput Screening	Periode 2	6.0	X_435047
Signal Transduction in Health and Disease	Periode 2	6.0	X_432535

Compulsory courses research master DDS

Vakken:

Naam	Periode	Credits	Code
ADMET	Periode 1	6.0	X_432721
Chemical Biology	Periode 1	6.0	X_432538
Drug Action	Periode 3	6.0	X_432724
Project Computational Design and Synthesis of Drugs	Periode 4	6.0	X_432734

Research Variant DDSA

The programme consists of 120 credits

- compulsory courses 30 credits (including a Literature Thesis and Colloquium 12 credits)
- compulsory choice Ethics and Portfolio Academic Skills 6 credits
- compulsory choices Major Research Project at least 42 credits
- optional courses to complete 120 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.

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Opleidingsdelen:

- [Ethics and Academic Skills](#)
- [Deficiency Courses](#)
- [Research project \(choose 42, 48, 54 or 60 EC\)](#)
- [Recommended optional courses](#)
- [Compulsory Courses](#)
- [Compulsory courses research master DDS](#)

Ethics and Academic Skills

Students need to select a total of 6 credits 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
Business and Innovation in Life Science	Periode 3	3.0	X_432539
Business Management in Health and Life Sciences	Periode 2	6.0	AM_470584
Clinical development and clinical trials	Periode 3	6.0	AM_470585
Communication, Organization and Management	Periode 2	6.0	AM_470572
Entrepreneurship in Health and Life Sciences	Periode 2	6.0	AM_470575
Ethics and Academic skills	Ac. Jaar (september)	1.0	X_432725
Ethics and Academic skills	Ac. Jaar (september)	2.0	X_432726
Ethics and Academic Skills	Ac. Jaar (september)	6.0	X_437556
Ethics and Academic Skills	Ac. Jaar (september)	3.0	X_432517
Ethics in Life Sciences	Periode 3	3.0	AM_470707
History of Life Sciences	Periode 3	3.0	AM_471017
Managing Science and Technology in Society	Periode 1	6.0	AM_470586
Qualitative and Quantitative Research Methods	Periode 1	6.0	AM_470582
Science and Communication	Periode 1	6.0	AM_470587
Science in Dialogue	Periode 2	6.0	AM_1002
Science Journalism	Periode 2	6.0	AM_471014
Scientific Writing in English	Periode 2, Periode 6	3.0	X_400592
Teaching Assistant	Ac. Jaar (september)	3.0	X_432741
Teaching Assistant	Ac. Jaar (september)	6.0	X_432742
Tutoring Students	Periode 2	3.0	X_432625

Deficiency Courses

Compulsory course for students without a Bachelor degree Pharmaceutical Sciences VU.

Not specified: all courses start with an summary of required knowledge.

Vakken:

Naam	Periode	Credits	Code
Principles of Pharmaceutical Sciences / Pharmacology	Periode 1	6.0	X_435675

Research project (choose 42, 48, 54 or 60 EC)

Compulsory choice of at least 42 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
Major Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	42.0	X_432559
Major Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	48.0	X_432561
Major Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	54.0	X_432562
Major Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	60.0	X_432563

Recommended optional courses

The subject options of 36, 30, 24, or 18 credits can be completed with the possibilities below.

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
Applied Theoretical Chemistry	Ac. Jaar (september)	12.0	X_432501
Applied Theoretical Chemistry	Ac. Jaar (september)	6.0	X_435612
Biomolecular Simulation in Medicinal Chemistry and Toxicology	Periode 5+6	6.0	X_432664
Company Training DDS Drug, Disp. and Saf. Assessm.	Ac. Jaar (september)	18.0	X_432672
Company Training DDS Drug, Disp. and Saf. Assessm.	Ac. Jaar (september)	24.0	X_432746
Company Training DDS Drug, Disp. and Saf. Assessm.	Ac. Jaar (september)	30.0	X_432751
Company Training DDS Drug, Disp. and Saf. Assessm.	Ac. Jaar (september)	36.0	X_432834

Computer-Aided Drug Design and Virtual Screening	Periode 2	6.0	X_432673
Internship abroad DDS Drug, Disp. and Saf. Assessm.	Ac. Jaar (september)	18.0	X_432677
Internship abroad DDS Drug, Disp. and Saf. Assessm.	Ac. Jaar (september)	24.0	X_432756
Internship abroad DDS Drug, Disp. and Saf. Assessm.	Ac. Jaar (september)	30.0	X_432761
Internship abroad DDS Drug, Disp. and Saf. Assessm.	Ac. Jaar (september)	36.0	X_432841
Minor Research Project Biomol. Drug Analysis	Ac. Jaar (september)	24.0	X_432658
Minor Research Project Biomol. Drug Analysis	Ac. Jaar (september)	18.0	X_432689
Minor Research Project Biomol. Drug Analysis	Ac. Jaar (september)	30.0	X_432704
Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	18.0	X_432692
Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	24.0	X_432693
Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	30.0	X_432705
Minor Research Project DDS Molecular Toxicology, CMCT	Ac. Jaar (september)	24.0	X_432632
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	24.0	X_432591
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	30.0	X_432592
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	18.0	X_432620
Minor Research Project DDS, CMCT	Ac. Jaar (september)	18.0	X_432507
Minor Research Project DDS, CMCT	Ac. Jaar (september)	30.0	X_432707
Minor Research Project Med. Chem., Drug Disc. & Target Find.	Ac. Jaar (september)	18.0	X_432696
Minor Research Project Med. Chem., Drug Disc. & Target Find.	Ac. Jaar (september)	30.0	X_432706

Minor Research Project Med. Chem., Drug Disc. & Target.Find.	Ac. Jaar (september)	24.0	X_432635
Signal Transduction in Health and Disease	Periode 2	6.0	X_432535
Supramolecular Chemistry and Nanomaterials	Periode 1	6.0	X_435653

Compulsory Courses

Vakken:

Naam	Periode	Credits	Code
Advanced Course on Drug Disp. & Safety Assessment (Mol.Tox.)	Periode 5+6	6.0	X_435681
Drug-induced Stress and Cellular Responses	Periode 2	6.0	X_432536
Literature thesis and Colloquium DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	12.0	X_432575

Compulsory courses research master DDS

Vakken:

Naam	Periode	Credits	Code
ADMET	Periode 1	6.0	X_432721
Chemical Biology	Periode 1	6.0	X_432538
Drug Action	Periode 3	6.0	X_432724
Project Computational Design and Synthesis of Drugs	Periode 4	6.0	X_432734

Research Variant CMCT

The programme consists of 120 credits

- compulsory courses 36 credits (including a Literature Thesis and Colloquium 12 credits)
- compulsory choice Ethics and Portfolio Academic Skills 6 credits
- compulsory choices Major Research Project at least 42 credits
- optional courses to complete 120 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.

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Opleidingsdelen:

- [Ethics and Academic Skills](#)
- [Deficiency Courses](#)
- [Research project \(choose 42, 48, 54 or 60 EC\)](#)
- [Recommended optional choice](#)
- [Compulsory Courses](#)
- [Compulsory courses research master DDS](#)

Ethics and Academic Skills

Students need to select a total of 6 credits 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
Business and Innovation in Life Science	Periode 3	3.0	X_432539
Business Management in Health and Life Sciences	Periode 2	6.0	AM_470584
Clinical development and clinical trials	Periode 3	6.0	AM_470585
Communication, Organization and Management	Periode 2	6.0	AM_470572
Entrepreneurship in Health and Life Sciences	Periode 2	6.0	AM_470575
Ethics and Academic skills	Ac. Jaar (september)	1.0	X_432725
Ethics and Academic skills	Ac. Jaar (september)	2.0	X_432726
Ethics and Academic Skills	Ac. Jaar (september)	6.0	X_437556
Ethics and Academic Skills	Ac. Jaar (september)	3.0	X_432517
Ethics in Life Sciences	Periode 3	3.0	AM_470707
History of Life Sciences	Periode 3	3.0	AM_471017
Managing Science and Technology in Society	Periode 1	6.0	AM_470586
Qualitative and Quantitative Research Methods	Periode 1	6.0	AM_470582
Science and Communication	Periode 1	6.0	AM_470587
Science in Dialogue	Periode 2	6.0	AM_1002
Science Journalism	Periode 2	6.0	AM_471014
Scientific Writing in English	Periode 2, Periode 6	3.0	X_400592

Teaching Assistant	Ac. Jaar (september)	3.0	X_432741
Teaching Assistant	Ac. Jaar (september)	6.0	X_432742
Tutoring Students	Periode 2	3.0	X_432625

Deficiency Courses

Compulsory course for students without a Bachelor degree Pharmaceutical Sciences VU.

Not specified: all courses start with an summary of required knowledge.

Vakken:

Naam	Periode	Credits	Code
Principles of Pharmaceutical Sciences / Pharmacology	Periode 1	6.0	X_435675

Research project (choose 42, 48, 54 or 60 EC)

Compulsory choice of at least 42 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
Major Research Project Mol. Tox., Comp. Med. Chem. & Tox.	Ac. Jaar (september)	42.0	X_432553
Major Research Project Mol. Tox., Comp. Med. Chem. & Tox.	Ac. Jaar (september)	48.0	X_432556
Major Research Project Mol. Tox., Comp. Med. Chem. & Tox.	Ac. Jaar (september)	54.0	X_432557
Major Research Project Mol. Tox., Comp. Med. Chem. & Tox.	Ac. Jaar (september)	60.0	X_432558

Recommended optional choice

The subject options of 30, 24, 18 or 12 credits can be completed with the possibilities below.

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
Applied Theoretical Chemistry	Ac. Jaar (september)	12.0	X_432501
Applied Theoretical Chemistry	Ac. Jaar (september)	6.0	X_435612
Company Training Comp. Med. Chem. & Tox.	Ac. Jaar (september)	18.0	X_432619
Company Training Comp. Med. Chem. & Tox.	Ac. Jaar (september)	24.0	X_432744
Company Training Comp. Med. Chem. & Tox.	Ac. Jaar (september)	30.0	X_432749
Company Training Comp. Med. Chem. & Tox.	Ac. Jaar (september)	36.0	X_432835
Density Functional Theory for Chemists	Ac. Jaar (september)	6.0	X_435111
Density Functional Theory for Chemists	Ac. Jaar (september)	12.0	X_435112
Drug-induced Stress and Cellular Responses	Periode 2	6.0	X_432536
Internship abroad DDS Comp. Med. Chem. & Tox.	Ac. Jaar (september)	18.0	X_432675
Internship abroad DDS Comp. Med. Chem. & Tox.	Ac. Jaar (september)	24.0	X_432754
Internship abroad DDS Comp. Med. Chem. & Tox.	Ac. Jaar (september)	30.0	X_432759
Internship abroad DDS Comp. Med. Chem. & Tox.	Ac. Jaar (september)	36.0	X_432838
Minor Research Project Biomol. Drug Analysis	Ac. Jaar (september)	24.0	X_432658
Minor Research Project Biomol. Drug Analysis	Ac. Jaar (september)	18.0	X_432689
Minor Research Project Biomol. Drug Analysis	Ac. Jaar (september)	30.0	X_432704
Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	18.0	X_432692
Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	24.0	X_432693
Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	30.0	X_432705
Minor Research Project DDS Molecular Toxicology, CMCT	Ac. Jaar (september)	24.0	X_432632
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	24.0	X_432591

Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	30.0	X_432592
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	18.0	X_432620
Minor Research Project DDS, CMCT	Ac. Jaar (september)	18.0	X_432507
Minor Research Project DDS, CMCT	Ac. Jaar (september)	30.0	X_432707
Minor Research Project Med. Chem., Drug Disc. & Target Find.	Ac. Jaar (september)	18.0	X_432696
Minor Research Project Med. Chem., Drug Disc. & Target Find.	Ac. Jaar (september)	30.0	X_432706
Minor Research Project Med. Chem., Drug Disc. & Target Find.	Ac. Jaar (september)	24.0	X_432635
Signal Transduction in Health and Disease	Periode 2	6.0	X_432535
Supramolecular Chemistry and Nanomaterials	Periode 1	6.0	X_435653

Compulsory Courses

Vakken:

Naam	Periode	Credits	Code
Biomolecular Simulation in Medicinal Chemistry and Toxicology	Periode 5+6	6.0	X_432664
Computer-Aided Drug Design and Virtual Screening	Periode 2	6.0	X_432673
Literature thesis and Colloquium CMCT	Ac. Jaar (september)	12.0	X_432576

Compulsory courses research master DDS

Vakken:

Naam	Periode	Credits	Code
ADMET	Periode 1	6.0	X_432721
Chemical Biology	Periode 1	6.0	X_432538
Drug Action	Periode 3	6.0	X_432724

Project Computational Design and Synthesis of Drugs	Periode 4	6.0	X_432734
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Research Variant DD&S

The programme consists of 120 credits

- compulsory courses 36 credits (including a Literature Thesis and Colloquium 12 credits)
- compulsory choice Ethics and Portfolio Academic Skills 6 credits
- compulsory choices Major Research Project at least 42 credits
- optional courses to complete 120 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.

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Opleidingsdelen:

- [Ethics and Academic Skills](#)
- [Deficiency Courses](#)
- [Research project \(choose 42, 48, 54 or 60 EC\)](#)
- [Recommended optional choice](#)
- [Compulsory Courses](#)
- [Compulsory courses research master DDS](#)

Ethics and Academic Skills

Students need to select a total of 6 credits 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
Business and Innovation in Life Science	Periode 3	3.0	X_432539
Business Management in Health and Life Sciences	Periode 2	6.0	AM_470584
Clinical development and clinical trials	Periode 3	6.0	AM_470585
Communication, Organization and Management	Periode 2	6.0	AM_470572

Entrepreneurship in Health and Life Sciences	Periode 2	6.0	AM_470575
Ethics and Academic skills	Ac. Jaar (september)	1.0	X_432725
Ethics and Academic skills	Ac. Jaar (september)	2.0	X_432726
Ethics and Academic Skills	Ac. Jaar (september)	6.0	X_437556
Ethics and Academic Skills	Ac. Jaar (september)	3.0	X_432517
Ethics in Life Sciences	Periode 3	3.0	AM_470707
History of Life Sciences	Periode 3	3.0	AM_471017
Managing Science and Technology in Society	Periode 1	6.0	AM_470586
Qualitative and Quantitative Research Methods	Periode 1	6.0	AM_470582
Science and Communication	Periode 1	6.0	AM_470587
Science in Dialogue	Periode 2	6.0	AM_1002
Science Journalism	Periode 2	6.0	AM_471014
Scientific Writing in English	Periode 2, Periode 6	3.0	X_400592
Teaching Assistant	Ac. Jaar (september)	3.0	X_432741
Teaching Assistant	Ac. Jaar (september)	6.0	X_432742
Tutoring Students	Periode 2	3.0	X_432625

Deficiency Courses

Compulsory course for students without a Bachelor degree Pharmaceutical Sciences VU.

Not specified: all courses start with an summary of required knowledge.

Vakken:

Naam	Periode	Credits	Code
Principles of Pharmaceutical Sciences / Pharmacology	Periode 1	6.0	X_435675

Research project (choose 42, 48, 54 or 60 EC)

Compulsory choice of at least 42 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
Major Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	42.0	X_432509

Major Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	48.0	X_432544
Major Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	54.0	X_432545
Major Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	60.0	X_432546

Recommended optional choice

The subject options of 30, 24, 18 or 12 credits can be completed with the possibilities below.

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
Biomolecular Simulation in Medicinal Chemistry and Toxicology	Periode 5+6	6.0	X_432664
Company Training DDS Drug Design & Synth.	Ac. Jaar (september)	18.0	X_432671
Company Training DDS Drug Design & Synth.	Ac. Jaar (september)	24.0	X_432745
Company Training DDS Drug Design & Synth.	Ac. Jaar (september)	30.0	X_432750
Company Training DDS Drug Design & Synth.	Ac. Jaar (september)	36.0	X_432833
Computer-Aided Drug Design and Virtual Screening	Periode 2	6.0	X_432673
Drug-induced Stress and Cellular Responses	Periode 2	6.0	X_432536
Internship abroad DDS Drug Design & Synth.	Ac. Jaar (september)	18.0	X_432676
Internship abroad DDS Drug Design & Synth.	Ac. Jaar (september)	24.0	X_432755
Internship abroad DDS Drug Design & Synth.	Ac. Jaar (september)	30.0	X_432760
Internship abroad DDS Drug Design & Synth.	Ac. Jaar (september)	36.0	X_432839
Minor Research Project Biomol. Drug Analysis	Ac. Jaar (september)	24.0	X_432658
Minor Research Project Biomol. Drug Analysis	Ac. Jaar (september)	18.0	X_432689

Minor Research Project Biomol. Drug Analysis	Ac. Jaar (september)	30.0	X_432704
Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	18.0	X_432692
Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	24.0	X_432693
Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	30.0	X_432705
Minor Research Project DDS Molecular Toxicology, CMCT	Ac. Jaar (september)	24.0	X_432632
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	24.0	X_432591
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	30.0	X_432592
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	18.0	X_432620
Minor Research Project DDS, CMCT	Ac. Jaar (september)	18.0	X_432507
Minor Research Project DDS, CMCT	Ac. Jaar (september)	30.0	X_432707
Minor Research Project Med. Chem., Drug Disc. & Target Find.	Ac. Jaar (september)	18.0	X_432696
Minor Research Project Med. Chem., Drug Disc. & Target Find.	Ac. Jaar (september)	30.0	X_432706
Minor Research Project Med. Chem., Drug Disc. & Target.Find.	Ac. Jaar (september)	24.0	X_432635
Signal Transduction in Health and Disease	Periode 2	6.0	X_432535

Compulsory Courses

Vakken:

Naam	Periode	Credits	Code
Literature thesis and Colloquium DDS Medical Chemistry, DD&S	Ac. Jaar (september)	12.0	X_432573
Physical-Organic Chemistry	Periode 1	6.0	X_435663
Synthetic Approaches in Medicinal Chemistry	Periode 2	6.0	X_435685

Compulsory courses research master DDS

Vakken:

Naam	Periode	Credits	Code
ADMET	Periode 1	6.0	X_432721
Chemical Biology	Periode 1	6.0	X_432538
Drug Action	Periode 3	6.0	X_432724
Project Computational Design and Synthesis of Drugs	Periode 4	6.0	X_432734

Research Variant Biomarkers and CCA

Opleidingsdelen:

- [Ethics and Academic Skills](#)
- [Deficiency Courses](#)
- [Choose 1 out of 3](#)
- [Compulsory Choice Research project \(Major\) including report](#)
- [Elective Space](#)
- [Compulsory Courses](#)
- [Compulsory courses research master DDS](#)

Ethics and Academic Skills

Students need to select a total of 6 credits 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
Business and Innovation in Life Science	Periode 3	3.0	X_432539
Business Management in Health and Life Sciences	Periode 2	6.0	AM_470584
Clinical development and clinical trials	Periode 3	6.0	AM_470585
Communication, Organization and Management	Periode 2	6.0	AM_470572
Entrepreneurship in Health and Life Sciences	Periode 2	6.0	AM_470575
Ethics and Academic skills	Ac. Jaar (september)	1.0	X_432725

Ethics and Academic skills	Ac. Jaar (september)	2.0	X_432726
Ethics and Academic Skills	Ac. Jaar (september)	6.0	X_437556
Ethics and Academic Skills	Ac. Jaar (september)	3.0	X_432517
Ethics in Life Sciences	Periode 3	3.0	AM_470707
History of Life Sciences	Periode 3	3.0	AM_471017
Managing Science and Technology in Society	Periode 1	6.0	AM_470586
Qualitative and Quantitative Research Methods	Periode 1	6.0	AM_470582
Science and Communication	Periode 1	6.0	AM_470587
Science in Dialogue	Periode 2	6.0	AM_1002
Science Journalism	Periode 2	6.0	AM_471014
Scientific Writing in English	Periode 2, Periode 6	3.0	X_400592
Teaching Assistant	Ac. Jaar (september)	3.0	X_432741
Teaching Assistant	Ac. Jaar (september)	6.0	X_432742
Tutoring Students	Periode 2	3.0	X_432625

Deficiency Courses

Compulsory course for students without a Bachelor degree Pharmaceutical Sciences VU.

Not specified: all courses start with an summary of required knowledge.

Vakken:

Naam	Periode	Credits	Code
Principles of Pharmaceutical Sciences / Pharmacology	Periode 1	6.0	X_435675

Choose 1 out of 3

Choice 1 out of 3 depending on the Major Project (to be discussed with the master coordinator)

Vakken:

Naam	Periode	Credits	Code
High-Throughput Screening	Periode 2	6.0	X_435047
Mass Spectrometry	Periode 2	6.0	X_435604
Protein Analysis	Periode 5	6.0	X_435045

Compulsory Choice Research project (Major) including report

Compulsory Choice of at least 42 ec.

Vakken:

Naam	Periode	Credits	Code
Major Research Project Biomol. Drug Analysis	Ac. Jaar (september)	42.0	X_432564
Major Research Project Biomol. Drug Analysis	Ac. Jaar (september)	48.0	X_432567
Major Research Project Biomol. Drug Analysis	Ac. Jaar (september)	54.0	X_432568
Major Research Project Biomol. Drug Analysis	Ac. Jaar (september)	60.0	X_432569

Elective Space

Students need to select 30, 24, 18 or 12 credits from the following list:

Vakken:

Naam	Periode	Credits	Code
Biomolecular Simulation in Medicinal Chemistry and Toxicology	Periode 5+6	6.0	X_432664
Company Training DDS Biomol. Drug Analysis	Ac. Jaar (september)	18.0	X_432670
Company Training DDS Biomol. Drug Analysis	Ac. Jaar (september)	24.0	X_432743
Company Training DDS Biomol. Drug Analysis	Ac. Jaar (september)	30.0	X_432748
Company Training DDS Biomol. Drug Analysis	Ac. Jaar (september)	36.0	X_432832
Computer-Aided Drug Design and Virtual Screening	Periode 2	6.0	X_432673
Drug-induced Stress and Cellular Responses	Periode 2	6.0	X_432536
Internship abroad DDS Biomol. Drug Analysis	Ac. Jaar (september)	18.0	X_432674
Internship abroad DDS Biomol. Drug Analysis	Ac. Jaar (september)	24.0	X_432753
Internship abroad DDS Biomol. Drug Analysis	Ac. Jaar (september)	30.0	X_432758
Internship abroad DDS Biomol. Drug Analysis	Ac. Jaar (september)	36.0	X_432837
Minor Research Project Biomol. Drug Analysis	Ac. Jaar (september)	24.0	X_432658
Minor Research Project Biomol. Drug Analysis	Ac. Jaar (september)	18.0	X_432689
Minor Research Project Biomol. Drug Analysis	Ac. Jaar (september)	30.0	X_432704

Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	18.0	X_432692
Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	24.0	X_432693
Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	30.0	X_432705
Minor Research Project DDS Molecular Toxicology, CMCT	Ac. Jaar (september)	24.0	X_432632
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	24.0	X_432591
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	30.0	X_432592
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	18.0	X_432620
Minor Research Project DDS, CMCT	Ac. Jaar (september)	18.0	X_432507
Minor Research Project DDS, CMCT	Ac. Jaar (september)	30.0	X_432707
Minor Research Project Med. Chem., Drug Disc. & Target Find.	Ac. Jaar (september)	18.0	X_432696
Minor Research Project Med. Chem., Drug Disc. & Target Find.	Ac. Jaar (september)	30.0	X_432706
Minor Research Project Med. Chem., Drug Disc. & Target.Find.	Ac. Jaar (september)	24.0	X_432635
Signal Transduction in Health and Disease	Periode 2	6.0	X_432535

Compulsory Courses

Compulsory Courses

Vakken:

Naam	Periode	Credits	Code
Bio-analysis & Clinical Diagnostics	Periode 1	6.0	X_432765
Literature thesis and Colloquium	Ac. Jaar (september)	12.0	X_432577
Omics-procedures in molecular clinical Diagnostics	Periode 5	6.0	X_432766

Compulsory courses research master DDS

Vakken:

Naam	Periode	Credits	Code
ADMET	Periode 1	6.0	X_432721
Chemical Biology	Periode 1	6.0	X_432538
Drug Action	Periode 3	6.0	X_432724
Project Computational Design and Synthesis of Drugs	Periode 4	6.0	X_432734

Double Degree

Opleidingsdelen:

- [Ethics and Academic Skills](#)
- [Deficiency Courses](#)
- [Elective Space](#)
- [Choice Thesis 1 out of 6](#)
- [Compulsory Courses](#)
- [Compulsory courses research master DDS](#)

Ethics and Academic Skills

Students need to select a total of 6 credits 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
Business and Innovation in Life Science	Periode 3	3.0	X_432539
Business Management in Health and Life Sciences	Periode 2	6.0	AM_470584
Clinical development and clinical trials	Periode 3	6.0	AM_470585
Communication, Organization and Management	Periode 2	6.0	AM_470572
Entrepreneurship in Health and Life Sciences	Periode 2	6.0	AM_470575
Ethics and Academic skills	Ac. Jaar (september)	1.0	X_432725
Ethics and Academic skills	Ac. Jaar (september)	2.0	X_432726

Ethics and Academic Skills	Ac. Jaar (september)	6.0	X_437556
Ethics and Academic Skills	Ac. Jaar (september)	3.0	X_432517
Ethics in Life Sciences	Periode 3	3.0	AM_470707
History of Life Sciences	Periode 3	3.0	AM_471017
Managing Science and Technology in Society	Periode 1	6.0	AM_470586
Qualitative and Quantitative Research Methods	Periode 1	6.0	AM_470582
Science and Communication	Periode 1	6.0	AM_470587
Science in Dialogue	Periode 2	6.0	AM_1002
Science Journalism	Periode 2	6.0	AM_471014
Scientific Writing in English	Periode 2, Periode 6	3.0	X_400592
Teaching Assistant	Ac. Jaar (september)	3.0	X_432741
Teaching Assistant	Ac. Jaar (september)	6.0	X_432742
Tutoring Students	Periode 2	3.0	X_432625

Deficiency Courses

Compulsory course for students without a Bachelor degree Pharmaceutical Sciences VU.

Not specified: all courses start with an summary of required knowledge.

Vakken:

Naam	Periode	Credits	Code
Principles of Pharmaceutical Sciences / Pharmacology	Periode 1	6.0	X_435675

Elective Space

Vakken:

Naam	Periode	Credits	Code
Advanced Course on Drug Disp. & Safety Assessment (Mol.Tox.)	Periode 5+6	6.0	X_435681
Bio-analysis & Clinical Diagnostics	Periode 1	6.0	X_432765
Biomolecular Simulation in Medicinal Chemistry and Toxicology	Periode 5+6	6.0	X_432664
Computer-Aided Drug Design and Virtual Screening	Periode 2	6.0	X_432673
Drug-induced Stress and Cellular Responses	Periode 2	6.0	X_432536

Minor Research Project Biomol. Drug Analysis	Ac. Jaar (september)	18.0	X_432689
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	18.0	X_432620
Minor Research Project DDS, CMCT	Ac. Jaar (september)	18.0	X_432507
Minor Research Project Med. Chem., Drug Disc. & Target Find.	Ac. Jaar (september)	18.0	X_432696
Omics-procedures in molecular clinical Diagnostics	Periode 5	6.0	X_432766
Physical-Organic Chemistry	Periode 1	6.0	X_435663
Signal Transduction in Health and Disease	Periode 2	6.0	X_432535
Synthetic Approaches in Medicinal Chemistry	Periode 2	6.0	X_435685

Choice Thesis 1 out of 6

Vakken:

Naam	Periode	Credits	Code
Colloquium and Literature Thesis	Ac. Jaar (september)	12.0	X_432574
Literature thesis and Colloquium	Ac. Jaar (september)	12.0	X_432577
Literature thesis and Colloquium CMCT	Ac. Jaar (september)	12.0	X_432576
Literature thesis and Colloquium DDS Medical Chemistry, DD&S	Ac. Jaar (september)	12.0	X_432573
Literature thesis and Colloquium DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	12.0	X_432575

Compulsory Courses

Vakken:

Naam	Periode	Credits	Code
ADMET	Periode 1	6.0	X_432721
Chemical Biology	Periode 1	6.0	X_432538
Drug Action	Periode 3	6.0	X_432724

Project Computational Design and Synthesis of Drugs	Periode 4	6.0	X_432734
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Compulsory courses research master DDS

Vakken:

Naam	Periode	Credits	Code
ADMET	Periode 1	6.0	X_432721
Chemical Biology	Periode 1	6.0	X_432538
Drug Action	Periode 3	6.0	X_432724
Project Computational Design and Synthesis of Drugs	Periode 4	6.0	X_432734

Social Variant

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.

To complete the entire Master programme (120 credits) of the Communication, education or social variant, the student has to choose 60 credits in DDS courses.

Opleidingsdelen:

- [DDS courses](#)
- [Recommended Optional Courses](#)
- [Compulsory Courses](#)

DDS courses

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.

To complete the entire Master programme (120 credits) of the Communication, education or social variant, the student has to choose 60 credits in DDS courses.

Opleidingsdelen:

- Specialisation Courses
- Literature and Colloquium (compulsory choose 1 of 5)
- DDS Research project (choose 1 of 5) (24 EC)
- Deficiency Courses

Specialisation Courses

In consultation with the master coordinator and depending of the choosen specialization 6 credits have to be chosen from the following list.

Vakken:

Naam	Periode	Credits	Code
ADMET	Periode 1	6.0	X_432721
Biomolecular Simulation in Medicinal Chemistry and Toxicology	Periode 5+6	6.0	X_432664
Chemical Biology	Periode 1	6.0	X_432538
Computer-Aided Drug Design and Virtual Screening	Periode 2	6.0	X_432673
Drug Action	Periode 3	6.0	X_432724
Drug-induced Stress and Cellular Responses	Periode 2	6.0	X_432536
Mass Spectrometry	Periode 2	6.0	X_435604
Physical-Organic Chemistry	Periode 1	6.0	X_435663
Project Computational Design and Synthesis of Drugs	Periode 4	6.0	X_432734
Signal Transduction in Health and Disease	Periode 2	6.0	X_432535
Synthetic Approaches in Medicinal Chemistry	Periode 2	6.0	X_435685

Literature and Colloquium (compulsory choose 1 of 5)

Students need to select a total of 6 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
Colloquium and Literature Thesis CMCT (C,E,M)	Ac. Jaar (september)	6.0	X_432571
Colloquium and Literature Thesis DDS BDA (C,E,M)	Ac. Jaar (september)	6.0	X_432570

Colloquium and Literature Thesis DDS MC, DD&S (C,E,M)	Ac. Jaar (september)	6.0	X_432623
Colloquium and Literature Thesis DDS MC, DDTF (C,E,M)	Ac. Jaar (september)	6.0	X_432624
Colloquium and Literature Thesis DDS Molecular Toxicology, DDSA (C,E,M)	Ac. Jaar (september)	6.0	X_432572

DDS Research project (choose 1 of 5) (24 EC)

Students need to select at least 30 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
Major Research Project DDS Biomolecular Drug Analysis (C,E,M)	Ac. Jaar (september)	24.0	X_432727
Major Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	24.0	X_432728
Major Research Project DDS Medicinal Chemistry, DDTF	Ac. Jaar (september)	24.0	X_432729
Major Research Project DDS Molecular Toxicology, CMCT	Ac. Jaar (september)	24.0	X_432730
Major Research Project DDS Molecular Toxicology, DDSA (C,E,M)	Ac. Jaar (september)	24.0	X_432731

Deficiency Courses

Compulsory course for students without a Bachelor degree Pharmaceutical Sciences VU.

Not specified: all courses start with an summary of required knowledge.

Vakken:

Naam	Periode	Credits	Code
Principles of Pharmaceutical Sciences / Pharmacology	Periode 1	6.0	X_435675

Recommended Optional Courses

Vakken:

Naam	Periode	Credits	Code
Business Management in Health and Life Sciences	Periode 2	6.0	AM_470584
Clinical development and clinical trials	Periode 3	6.0	AM_470585
Entrepreneurship in Health and Life Sciences	Periode 2	6.0	AM_470575
Policy, Politics and Participation	Periode 2	6.0	AM_470589

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 Societal Specialisation	Ac. Jaar (september)	30.0	AM_471147
Qualitative and Quantitative Research Methods	Periode 1	6.0	AM_470582

ADMET

Vakcode	X_432721 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J.N.M. Commandeur
Examinator	dr. J.N.M. Commandeur
Docent(en)	dr. J.N.M. Commandeur
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak

To get familiar with the biochemical and physiological processes underlying the pharmacokinetics and adverse side effects of drugs, and strategies to improve ADMET-properties by structural modification

Inhoud vak

Of the thousands of novel compounds that are developed by drug discovery project teams, only a fraction have the appropriate pharmacokinetic properties to become a drug product. Pharmacokinetics is determined by the complex processes involved in absorption (A), distribution (D), metabolism (M) and excretion (E) of the drug, the so-called ADME-processes. Furthermore, 20% of the drug entering the clinical development phase fail, because of unwanted/toxic (T) side-effects.

In this course, the students will be familiarized with:

- the pharmacokinetic concepts and the mathematical models by which the time-course of plasma- and tissueconcentration of a drug can be described and which plays an important role in identification of the pharmacokinetic defect(s) of a drug.
- experimental and computational approaches used to predict the ADMET-properties of a new chemical entity;
- the relationship between physico-chemical properties (pKa, logP, logD, solubility, permeability, etc) and ADME-properties, and analytical-chemical approaches to determine physico-chemical properties;
- role of drug metabolism in adverse drug reactions: metabolic stability, drug-drug interactions, active metabolites, genetic polymorphism
- strategies to improve ADME-properties by structural modification of compounds;
- Covalent drugs

Onderwijsvorm

lectures and case studies.

Toetsvorm

Written exam and case reports.

Literatuur

Book: 'Drug-like properties: concepts, structure design and methods. From ADME to Toxicity optimization.' Eds. E.H. Kerns and L. Di, Academic Press, 2008, ISBN: 978-0-1236-9520-8.

Doelgroep

mDDS-BCCA, mDDS-CMCT, mDDS-DD&S, mDDS-DDSA, mDDS-DDTF, mDDS-C-var, mDDS-E-var, mDDS-M-var

Advanced Course on Drug Disp. & Safety Assessment (Mol.Tox.)

Vakcode	X_435681 (435681)
Periode	Periode 5+6
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Lesmethode(n)	Werkcollege
Niveau	500

Doel vak

Obtaining an in-depth overview and knowledge of drug disposition and safety assessment, with emphasis on molecular and biochemical mechanisms.

Inhoud vak

After a general introduction in toxicology, drug absorption, drug distribution, drug elimination, drug metabolism and toxicokinetics will be treated. More general mechanisms of toxicity, such as mutagenesis, carcinogenesis, developmental toxicity and idiosyncratic drug reactions, will then be treated. Subsequently, organ-selective toxicities of drugs and other chemicals will be treated, with special emphasis on molecular and biochemical mechanism and structure dependencies. Methods to test toxicities as well as the evaluation of toxicities in terms of safety and health risks will also be treated. Special attention will be given to biotransformation enzymes and their role in drug toxication and detoxication and to the most recent developments in molecular toxicology.

Toetsvorm

Written examination, blackboard and cases.

Literatuur

Casarett, and Doull, Toxicology: The Basic Science of Poisons 7th ed. New York: Pergamon Press (ISBN 987-0-07-147051-3).
Selected research papers.

Vereiste voorkennis

Courses "Molecular pharmacology & toxicology of drugs and/or Drug toxicity: concepts and experimentele approaches" or equivalent courses are advised.

Doelgroep

mDDS-DDSA, mDDS-DDTF

Algemene didactiek en Pedagogiek I

Vakcode	O_MLADEPI ()
Periode	Periode 1+2, Periode 4+5
Credits	6.0
Voertaal	Nederlands
Faculteit	Faculteit der Psychologie en Pedagogiek
Docent(en)	drs. J.K.W. Riksen, drs. H.R. Goudsmit, drs. Y.G. Meindersma, drs. W.S. Hoekstra, drs. C.D.P. van Oeveren, drs. S. Donszelmann, drs. B. Klein, drs. W. Jongejan, dr. H.B. Westbroek, dr. E. van den Berg, C.L. Geraedts, drs. A. Krijgsman, dr. A.A. Kaal, dr. J.J.M. van Eersel, drs. K.L. Schaap, W. Maas, drs. G.D. van Hummel, F.L. de Vries MSc, drs. H. Stouthart, drs. I. Pauw
Lesmethode(n)	Hoorcollege
Niveau	500

Doel vak

De student kan algemene onderwijskundige en pedagogische inzichten op het terrein van (activerende) didactiek (rol van ontwerper), communicatie in de klas (rol van uitvoerder) en gedrag- en leerproblemen (verdiepende module) vertalen naar de eigen lespraktijk.

Inhoud vak

Deze module kent 4 onderdelen:

- de startweek (1 erts), waarin de student kennis maakt met de opleiding, met het basisinstrumentarium van een docent en de eigen startcompetenties in kaart brengt;
- colleges ten aanzien van de rol van Ontwerper en de rol van Uitvoerder;
- colleges over gedrag- en leerproblemen, waarin problematiek en aanpak van meest gangbare gedrag- en leerproblemen aan bod komen.

Onderwijsvorm

Colleges (hoorcolleges en werkgroepen)

Toetsvorm

- beoordeling van het portfolio
- tentamen over de colleges gedrag- en leerproblemen

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

Voor alle onderdelen (startweek, rollen, verdiepende module) geldt een aanwezigheidsplicht

Algemene Didactiek en Pedagogiek II

Vakcode	O_MLADEPII ()
Periode	Periode 1+2, Periode 4+5
Credits	3.0
Voertaal	Nederlands
Faculteit	Faculteit der Psychologie en Pedagogiek
Docent(en)	drs. J.K.W. Riksen, drs. H.R. Goudsmit, drs. Y.G. Meindersma, drs. W.S. Hoekstra, drs. C.D.P. van Oeveren, drs. S. Donszelmann, drs. B. Klein, dr. T. Bosma, dr. H.B. Westbroek, dr. E. van den Berg, C.L. Geraedts, drs. A. Krijgsman, dr. A.A. Kaal, dr. J.J.M. van Eersel, drs. K.L. Schaap, W. Maas, drs. G.D. van Hummel, F.L. de Vries MSc, drs. H. Stouthart, drs. I. Pauw
Lesmethode(n)	Hoorcollege, Werkcollege
Niveau	500

Doel vak

De student kan:

1. leerlingen, als individu en als lid van de groep, ondersteunen en stimuleren in hun verdere persoons- en identiteitsontwikkeling;
2. de voorbeeldfunctie ten opzichte van leerlingen vormgeven en daarop reflecteren;
3. leerlingen helpen bij de voorbereiding op hun rol in de samenleving als actief participierend burger;

4. deze en eerdere verworven competenties aantonen in een showcaseportfolio

Inhoud vak

Deze module kent 2 onderdelen:

- colleges ten aanzien van de rol van Pedagoog;
- het werken aan de rolopdachten voor de rol van uitvoerder, ontwerper en pedagoog voor het showcaseportfolio;

Onderwijsvorm

Colleges (hoorcolleges en werkgroepen) en zelfstudie

Toetsvorm

- een tentamen betreffende de rol van Pedagoog
- beoordeling van het showcase portfolio, waarin de student de verworven competenties ten aanzien van alle rollen aantoont

Literatuur

Een literatuurlijst wordt verstrekt aan het begin van de opleiding, en staat op Blackboard bij de betreffende studieonderdeel

Vereiste voorkennis

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

Overige informatie

Voor de colleges geldt een aanwezigheidsplicht. Studenten die dit vooraf met de vakdidacticus/mentor overeengekomen zijn, kunnen in zelfstudie onderdelen afronden.

Analysis of Governmental Policy

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

Doel vak

- To acquire critical knowledge regarding different policy models and theories
- To master the correct use of central concepts in political and policy discourses.
- To further deepen your analytic skills with respect to the critical assessment of a complex societal question or dilemma in the health and life science;
- To learn to integrate science- specific knowledge with the knowledge and skills of other disciplines of the social sciences
- To practice skills in data collection and analysis
- To learn to set up valid lines of argumentation;

- To learn to translate research findings into policy recommendations;
- To get experienced in writing a policy advisory report;
- To improve your communication skills;
- To improve your skills in working effectively in a project team, through team building, team analysis and feedback.

Inhoud vak

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

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

Onderwijsvorm

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

The different elements have the following study time:

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

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

Toetsvorm

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

Literatuur

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

Aanbevolen voorkennis

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

Doelgroep

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

Overige informatie

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

Applied Theoretical Chemistry

Vakcode	X_432501 (432501)
Periode	Ac. Jaar (september)
Credits	12.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. F.M. Bickelhaupt
Examinator	prof. dr. F.M. Bickelhaupt
Niveau	500

Doel vak

Understanding and predicting molecular structure and chemical reactivity.

Inhoud vak

Theoretical Chemistry has become an integral part of modern chemistry. Numerous properties can be computed with chemical accuracy, thus, enabling one to study or predict quantities that are hardly or not at all accessible through experimental techniques. But with this, the potential of theoretical chemistry is still not exhausted. In order to design syntheses, catalysts or pharmacologically active molecules in a more rational fashion (i.e., instead of using a trial-and-error approach), it is of crucial importance to combine accuracy with solid and profound insight into the underlying mechanisms in the electronic structure. This holds true also if such investigations are done in the form of computational chemistry. Such insight can be obtained through detailed analyses of the computed wavefunction and bond energy. The purpose of this course is to acquire the skills that one needs for a minute understanding of the nature of a chemical phenomenon. Here, the molecular orbital (MO) model contained in the so-called Kohn-Sham density functional theory plays a pivotal role.

Onderwijsvorm

The course consists of an intensive theoretical introduction in the first week followed by a research project in which the student participates in one of the research lines of the group.

Toetsvorm

Examination of the course occurs on the basis of a research report.

Literatuur

Parts of: (a) T. A. Albright, J. K. Burdett, M.-H. Whangbo, *Orbital Interactions in Chemistry*, Wiley-Interscience, New York, 1985; (b) F.M.

Bickelhaupt, E.J. Baerends, Kohn-Sham Density Functional Theory: Predicting and Understanding Chemistry, in: Rev. Comput. Chem.; K.B. Lipkowitz, D.B. Boyd, Eds.; Wiley-VCH: New York, Vol. 15.

Aanbevolen voorkennis

BSc Scheikunde of BSc Farmaceutische Wetenschappen

Doelgroep

MSc Chemistry en MSc DDS

Applied Theoretical Chemistry

Vakcode	X_435612 (435612)
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. F.M. Bickelhaupt
Examinator	prof. dr. F.M. Bickelhaupt
Niveau	500

Doel vak

Understanding and predicting molecular structure and chemical reactivity.

Inhoud vak

Theoretical Chemistry has become an integral part of modern chemistry. Numerous properties can be computed with chemical accuracy, thus, enabling one to study or predict quantities that are hardly or not at all accessible through experimental techniques. But with this, the potential of theoretical chemistry is still not exhausted. In order to design syntheses, catalysts or pharmacologically active molecules in a more rational fashion (i.e., instead of using a trial-and-error approach), it is of crucial importance to combine accuracy with solid and profound insight into the underlying mechanisms in the electronic structure. This holds true also if such investigations are done in the form of computational chemistry. Such insight can be obtained through detailed analyses of the computed wavefunction and bond energy. The purpose of this course is to acquire the skills that one needs for a minute understanding of the nature of a chemical phenomenon. Here, the molecular orbital (MO) model contained in the so-called Kohn-Sham density functional theory plays a pivotal role.

Onderwijsvorm

The course consists of an intensive theoretical introduction in the first week followed by a research project in which the student participates in one of the research lines of the group.

Toetsvorm

Examination of the course occurs on the basis of a research report.

Literatuur

Parts of: (a) T. A. Albright, J. K. Burdett, M.-H. Whangbo, Orbital Interactions in Chemistry, Wiley-Interscience, New York, 1985; (b) F.M. Bickelhaupt, E.J. Baerends, Kohn-Sham Density Functional Theory:

Predicting and Understanding Chemistry, in: Rev. Comput. Chem.; K.B. Lipkowitz, D.B. Boyd, Eds.; Wiley-VCH: New York, Vol. 15.

Aanbevolen voorkennis

BSc Scheikunde of BSc Farmaceutische Wetenschappen

Doelgroep

mCh, mDDS

Overige informatie

This course exists in two variants. The first variant is worth 6 cp (code 435612) and can be extended to 12 cp (code 432501).

Bio-analysis & Clinical Diagnostics

Vakcode	X_432765 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H. Lingeman
Examinator	dr. H. Lingeman
Docent(en)	dr. H. Lingeman
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak

Giving a clear account on the instrumental bio-analytical techniques and strategies in bio-analysis and clinical diagnostics.

Inhoud vak

This basic course on bio-analytical and clinical chemistry is focusing on decision trees (strategic decisions) that can be used during the method development and optimization of analytical procedures to determine both endogenous and exogenous compounds in complex biological samples. Approaches and procedures with respect to sampling, sample preparation, separation, spectroscopy, electrochemistry, as well as immunological and enzymatic procedures will be dealt with. Case studies will be used to clarify the decisions that have to be taken.

Onderwijsvorm

Lectures and tutorials.

Toetsvorm

Written or oral examination.

Literatuur

Hand-outs (electronically available).

Aanbevolen voorkennis

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

Doelgroep

Biomolecular Simulation in Medicinal Chemistry and Toxicology

Vakcode	X_432664 (432664)
Periode	Periode 5+6
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. D.P. Geerke
Examinator	dr. D.P. Geerke
Docent(en)	dr. C. de Graaf, dr. D.P. Geerke
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak

Providing theoretical background on biomolecular simulation and free-energy calculation methods and an overview of recent developments, applications, and trends.

Inhoud vak

Methods and techniques for calculating molecular energies of biomolecular systems (molecular mechanics / force fields) and for flexibility analysis (conformational search methods).

Theory (statistical mechanics), method development (algorithms) and application of molecular dynamics simulations and free energy calculations.

Proper and efficient treatment of nonbonded interactions: force field development, boundary conditions, long-range forces.

Analysis of simulation data: secondary structure, solvation and thermodynamic properties, transport and correlation.

Special focus on methods to predict binding affinities from MD simulation (thermodynamic integration, free energy perturbation) and their application.

Onderwijsvorm

Lectures, tutorials, exercises, and self-study.

Toetsvorm

Written or oral examination

Literatuur

Leach, A.R., Molecular Modelling: Principles and Applications. (ISBN 0-582-38210-6).

Recent review articles that will be made available via Blackboard.

Vereiste voorkennis

Course "Computational Design and Synthesis of Drugs"

Aanbevolen voorkennis

Course "Computational Design and Synthesis of Drugs"

Doelgroep

Overige informatie

Please contact the coordinator two weeks prior to the start of the course (e-mail: d.p.geerke@vu.nl).

Business and Innovation in Life Science

Vakcode	X_432539 (432539)
Periode	Periode 3
Credits	3.0
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	400

Doel vak

This course positions the field of Biomolecular Sciences in a broader context by sketching out the Pharma-Biotech industrial landscape.

Inhoud vak

The Pharma-Biotech industrial landscape is presented in several ways;

1. business and value chain modeling common in these industries
2. product strategy and life-cycle dynamic in the Pharma and Biotech sector
3. innovation and the position of Genomics and Proteomics in the future of Health and Life Sciences

In addition to lectures on the above 3 topics, students will be handed certain texts and articles that illustrate the 'State of the Art' in the Pharma-Biotech industrial 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 bioscientific research through product development. The course thus aims to provide a first general overview of how life science and business are interwoven in everyday industrial practice.

Two 'real-life' cases will be discussed and students will execute 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.

As part of this course, a guest speaker from industry will be giving a lecture.

Onderwijsvorm

Lectures, guest lectures by industrial and Life Science venture capital firm representatives, final presentation.

Two harvard case will be used including assignments.

Toetsvorm

In order to receive 3 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)
- case analysis and presentation in front of the entire class with a grade 6 or more (50%)

Written exam w 4 open questions.

Literatuur

Rydzewski - Real world Drug Discovery , A chemist's guide to Biotech and Pharmaceutical Research (selected chapters)- 2008

Additional literature provided on Blackboard.

Vereiste voorkennis

This course assumes students have a thorough knowledge and understanding of the life sciences, including biochemistry.

Aanbevolen voorkennis

Completed Bachelor Physics, Chemistry, Biology, Medical Biology
Pharmaceutical Sciences, Medical Natural Science or Science Business and Innovation.

Doelgroep

Master Bio molecular Sciences (BMS) , Chemistry, Drug Discovery & Safety and Oncology

Overige informatie

In case you have any questions about this course, please send an Email to the coordinator at <p.van.hoorn@vu.nl>

Business Management in Health and Life Sciences

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

Doel vak

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

To get acquainted with:

- financial and legal aspects
- patents and alternative valorization methods

- marketing and sales aspects of businesses
- To acquire insight in Human Resource Management models
- To get acquainted with different models of financing
- To learn to think and act in line with economic and sustainability issues for the company

Inhoud vak

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

Onderwijsvorm

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

Toetsvorm

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

Literatuur

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

Doelgroep

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

Overige informatie

Guest lecturers/organisations:

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

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 (e.g. SPR, FRET, BRET, High-content & High resolution analysis), 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, Signal Transduction in Health and Disease, or equivalent

Doelgroep

mBMS-BC, mCh-SBI, mDDS-BCCA, mDDS-CMCT, mDDS-DD&S, mDDS-DDSA, mDDS-DDTF, mDDS-C-var, mDDS-E-var, mDDS-M-var, mPhys-SBI

Intekenprocedure

Please register as soon as possible online.

Overige informatie

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

Clinical development and clinical trials

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

Doel vak

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

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

To acquire knowledge and insight into clinical study methodology

To acquire knowledge and skills into the regulatory principles

To acquire knowledge of ICH-GCP and quality

To acquire knowledge and insight into clinical trial coordination

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

To acquire insight into the ethical aspects

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

To learn to design a clinical study

To acquire insight into the different epidemiologic study designs

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

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

Inhoud vak

The need for rigorous evaluation of components of health care is increasingly recognised worldwide. An important type of evaluation is the clinical trial. The most commonly performed clinical trials evaluate new drugs, medical devices, biologics, or other interventions on patients in strictly scientifically controlled settings, and are required for regulatory authority approval of new therapies. This course aims to provide students with a theoretical and practical understanding of the issues involved in the design, conduct, analysis and interpretation of clinical trials of health interventions. Furthermore classes are provided on which the actual use of clinical trials in day

to day R&D strategies within industry and universities is addressed in detail. Classes include: 'Life Cycle of a Clinical Trial', 'Clinical Trial Methodology', 'ICH-GCP Principles', 'The Ethics Committee', 'Safety Considerations in Clinical Trials', 'Quality Control & Quality Assurance', 'Compliance, Misconduct & Fraud'.

An additional week of basic epidemiology will help you to complement the knowledge obtained so far in the course with an understanding of the principles of other types of study designs (cross-sectional, longitudinal, case-control). Issues concerning exposure and disease measurement and exposure-disease relationships will be discussed in detail, and examples will be provided. Together with your colleagues, you will learn how to apply this knowledge first by hand (during the lectures), then to an epidemiologic database (during the computer-based sessions) and how to interpret the results critically.

Onderwijsvorm

Lectures: 25h

(Computer) workgroup: 32h

Preparing the exam: 2h

Toetsvorm

Written exam: 100%

Literatuur

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

Doelgroep

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

Overige informatie

Guest lecturers/organisations:

- Eric Klaver
- DOCS
- Others to be announced

Colloquium and Literature Thesis

Vakcode	X_432574 (432574)
Periode	Ac. Jaar (september)
Credits	12.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M.H. Siderius
Examinator	dr. M.H. Siderius
Niveau	600

Doel vak

To be able to efficiently retrieve in-depth information about a given scientific topic, logically categorize and describe the information in a thesis, and present the main findings in a colloquium.

Inhoud vak

Completion of an academic MSc degree does not only imply practical experience and knowledge from the scientific specialisation, it also implies that one is able to deal with substantial amounts of scientific information in an efficient way and distill this into the main points. During the literature thesis, the student will collect recent in-depth scientific literature about a given research topic, usually a topic of direct interest to the research group. The literature information is described in a coherent form in a thesis, which is also presented orally during a colloquium.

Onderwijsvorm

Self-study, contact hours with supervisor.

Toetsvorm

Thesis, colloquium.

Doelgroep

mDDS-DDTF

Overige informatie

Please contact the coordinator in advance for a discussion and planning of the topic.

Colloquium and Literature Thesis CMCT (C,E,M)

Vakcode	X_432571 (432571)
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. D.P. Geerke
Examinator	dr. D.P. Geerke
Niveau	600

Colloquium and Literature Thesis DDS BDA (C,E,M)

Vakcode	X_432570 (432570)
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H. Lingeman
Examinator	dr. H. Lingeman
Niveau	600

Doel vak

Literature study on a topic related to biomolecular analysis.

Inhoud vak

The topic will be chosen in close cooperation and with approval of the master coordinator.

Onderwijsvorm

Selfstudy and discussion sessions.

Toetsvorm

Report and presentations.

Doelgroep

mDDS

Overige informatie

Please contact the coordinator.

Colloquium and Literature Thesis DDS MC, DD&S (C,E,M)

Vakcode	X_432623 (432623)
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M. Wijtmans
Examinator	dr. M. Wijtmans
Niveau	600

Doel vak

To be able to efficiently retrieve in-depth information about a given scientific topic, logically categorize and describe the information in a thesis, and present the main findings in a colloquium.

Inhoud vak

Completion of an academic MSc degree does not only imply practical experience and knowledge from the scientific specialisation, it also implies that one is able to deal with substantial amounts of scientific information in an efficient way and distill this into the main points. During the literature thesis, the student will collect recent in-depth scientific literature about a given Medicinal Chemistry research topic, usually a topic of direct interest to the research group. The literature information is described in a coherent form in a thesis, which is also presented orally during a colloquium.

Onderwijsvorm

Self-study, contact hours with supervisor.

Toetsvorm

Thesis, colloquium.

Literatuur

A guide with general hints and tips on writing a thesis will be provided.

Doelgroep

mDDS-DD&S

Intekenprocedure

Please contact the coordinator in advance for a discussion and planning of the topic.

Colloquium and Literature Thesis DDS MC, DDTF (C,E,M)

Vakcode	X_432624 (432624)
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M.H. Siderius
Examinator	dr. M.H. Siderius
Niveau	600

Doel vak

To be able to efficiently retrieve in-depth information about a given scientific topic, logically categorize and describe the information in a thesis, and present the main findings in a colloquium.

Inhoud vak

Completion of an academic MSc degree does not only imply practical experience and knowledge from the scientific specialization, it also implies that one is able to deal with substantial amounts of scientific information in an efficient way and distill this into the main points. During the literature thesis, the student will collect recent in-depth scientific literature about a given research topic, usually a topic of direct interest to the research group. The literature information is described in a coherent form in a thesis, which is also presented orally during a colloquium.

Onderwijsvorm

Self-study, contact hours with supervisor.

Doelgroep

mDDS-DDTF

Overige informatie

Please contact the coordinator in advance for a discussion and planning of the topic.

Colloquium and Literature Thesis DDS Molecular Toxicology, DDSA (C,E,M)

Vakcode	X_432572 (432572)
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J.N.M. Commandeur
Examinator	dr. J.N.M. Commandeur
Niveau	600

Doel vak

To demonstrate that the student is able to collect relevant and recent primary scientific literature on a predefined subject in the area of molecular and biochemical toxicology, to organize the information in chapters and to draw conclusions on the perspectives or relevance of the subject.

Inhoud vak

The content of the literature thesis/colloquium depends on the subject which will be selected in consultation with master coordinator dr. JNM Commandeur (j.n.m.commandeur@vu.nl).

Onderwijsvorm

Literature study

Toetsvorm

Written literature thesis and oral presentation (colloquium) for the department of Pharmaceutical Sciences.

Literatuur

Literature study

Aanbevolen voorkennis

The courses ADMET, Drug-induced stress and cellular responses or equivalent courses.

Doelgroep

mDDS-DDSA MCE-variant

Overige informatie

A list of subjects for the literature thesis and colloquium can be obtained from dr. JNM Commandeur (j.n.m.commandeur@vu.nl).

Communication, Organization and Management

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

Doel vak

To get acquainted with theories on organisational behaviour
 To obtain a deeper understanding of communication from the perspective of sharing and influencing results
 To acquire knowledge on organisational structures and designs
 To get acquainted with important theories on organisational transitions and change management
 To acquire insight into different management practices in the health and life sciences sector

To gain insight in leadership and interpersonal behaviour
To obtain insight in methods for motivation and conflict management
To improve communication skills
To practise analytical and advisory skills

Inhoud vak

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

Onderwijsvorm

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

Toetsvorm

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

Literatuur

To be announced on Blackboard

Doelgroep

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

Overige informatie

Attendance to training, workshops, interviews and discussions is indispensable

Company Training Comp. Med. Chem. & Tox.

Vakcode	X_432619 (432619)
Periode	Ac. Jaar (september)
Credits	18.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. D.P. Geerke

Examinator	dr. D.P. Geerke
Niveau	500

Doel vak

To obtain experience in doing scientific research in an industrial setting.

Inhoud vak

During a traineeship, the student actively participates in a research project within a company.

Toetsvorm

Report, presentation and practical work.

Doelgroep

mDDS

Overige informatie

Please contact the coordinator well in advance to check for possibilities and to discuss the most suitable duration of the traineeship.

Company Training Comp. Med. Chem. & Tox.

Vakcode	X_432744 ()
Periode	Ac. Jaar (september)
Credits	24.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. D.P. Geerke
Examinator	dr. D.P. Geerke
Niveau	500

Doel vak

To obtain experience in doing scientific research in an industrial setting.

Inhoud vak

During a traineeship, the student actively participates in a research project within a company.

Toetsvorm

Report, presentation and practical work.

Doelgroep

mDDS

Overige informatie

Please contact the coordinator well in advance to check for possibilities and to discuss the most suitable duration of the traineeship.

Company Training Comp. Med. Chem. & Tox.

Vakcode	X_432749 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. D.P. Geerke
Examinator	dr. D.P. Geerke
Niveau	500

Doel vak

To obtain experience in doing scientific research in an industrial setting.

Inhoud vak

During a traineeship, the student actively participates in a research project within a company.

Toetsvorm

Report, presentation and practical work.

Doelgroep

mDDS

Overige informatie

Please contact the coordinator well in advance to check for possibilities and to discuss the most suitable duration of the traineeship.

Company Training Comp. Med. Chem. & Tox.

Vakcode	X_432835 ()
Periode	Ac. Jaar (september)
Credits	36.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. D.P. Geerke
Examinator	dr. D.P. Geerke
Niveau	500

Company Training DDS Biomol. Drug Analysis

Vakcode	X_432670 (432670)
Periode	Ac. Jaar (september)
Credits	18.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J. Kool
Examinator	dr. J. Kool
Niveau	500

Doel vak

To acquire knowledge and insight into the role and objectives of drug, bio-analytical and clinical development processes.

Inhoud vak

This course aims to provide students with a theoretical and practical understanding of the issues involved in the design, conduct, analysis and interpretation of clinical trails of health interventions.

Doelgroep

mDDS

Overige informatie

For further information please contact Henk Lingeman

Company Training DDS Biomol. Drug Analysis

Vakcode	X_432743 ()
Periode	Ac. Jaar (september)
Credits	24.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H. Lingeman
Examinator	dr. H. Lingeman
Niveau	500

Doel vak

To acquire knowledge and insight into the role and objectives of drug, bio-analytical and clinical development processes.

Inhoud vak

This course aims to provide students with a theoretical and practical understanding of the issues involved in the design, conduct, analysis and interpretation of clinical trails of health interventions.

Doelgroep

mDDS

Overige informatie

For further information please contact Henk Lingeman

Company Training DDS Biomol. Drug Analysis

Vakcode	X_432748 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H. Lingeman
Examinator	dr. H. Lingeman
Niveau	500

Doel vak

To acquire knowledge and insight into the role and objectives of drug, bio-analytical and clinical development processes.

Inhoud vak

This course aims to provide students with a theoretical and practical understanding of the issues involved in the design, conduct, analysis and interpretation of clinical trials of health interventions.

Doelgroep

mDDS

Overige informatie

For further information please contact Henk Lingeman

Company Training DDS Biomol. Drug Analysis

Vakcode	X_432832 ()
Periode	Ac. Jaar (september)
Credits	36.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H. Lingeman
Examinator	dr. H. Lingeman
Niveau	500

Doel vak

To acquire knowledge and insight into the role and objectives of drug, bio-analytical and clinical development processes.

Inhoud vak

This course aims to provide students with a theoretical and practical understanding of the issues involved in the design, conduct, analysis and interpretation of clinical trials and health intervention.

Doelgroep

mDDS

Company Training DDS Drug Design & Synth.

Vakcode	X_432671 (432671)
Periode	Ac. Jaar (september)
Credits	18.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M. Wijtmans
Examinator	dr. M. Wijtmans
Niveau	500

Doel vak

To obtain experience in doing scientific research in a company setting.

Inhoud vak

During a traineeship, the student actively participates in a research project within a company.

Toetsvorm

Report, presentation and practical work.

Doelgroep

mDDS

Intekenprocedure

Please contact the coordinator well in advance to check for possibilities and to discuss the most suitable duration of the traineeship.

Company Training DDS Drug Design & Synth.

Vakcode	X_432745 ()
Periode	Ac. Jaar (september)
Credits	24.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M. Wijtmans
Examinator	dr. M. Wijtmans
Niveau	500

Doel vak

To obtain experience in doing scientific research in a company setting.

Inhoud vak

During a traineeship, the student actively participates in a research project within a company.

Toetsvorm

Report, presentation and practical work.

Doelgroep

mDDS

Intekenprocedure

Please contact the coordinator well in advance to check for possibilities and to discuss the most suitable duration of the traineeship.

Company Training DDS Drug Design & Synth.

Vakcode	X_432750 ()
Periode	Ac. Jaar (september)
Credits	30.0

Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M. Wijtmans
Examinator	dr. M. Wijtmans
Niveau	500

Doel vak

To obtain experience in doing scientific research in a company setting.

Inhoud vak

During a traineeship, the student actively participates in a research project within a company.

Toetsvorm

Report, presentation and practical work.

Doelgroep

mDDS

Intekenprocedure

Please contact the coordinator well in advance to check for possibilities and to discuss the most suitable duration of the traineeship.

Company Training DDS Drug Design & Synth.

Vakcode	X_432833 ()
Periode	Ac. Jaar (september)
Credits	36.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M. Wijtmans
Examinator	dr. M. Wijtmans
Niveau	500

Doel vak

To obtain experience in doing scientific research in a company setting.

Inhoud vak

During a traineeship, the student actively participates in a research project within a company.

Toetsvorm

Report, presentation and practical work.

Doelgroep

mDDS

Intekenprocedure

Please contact the coordinator well in advance to check for possibilities and to discuss the most suitable duration of the traineeship.

Company Training DDS Drug, Disp. and Saf. Assessm.

Vakcode	X_432672 (432672)
Periode	Ac. Jaar (september)
Credits	18.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J.N.M. Commandeur
Examinator	dr. J.N.M. Commandeur
Niveau	500

Doel vak

To perform research in the area of molecular and biochemical toxicology and risk assessment in an industrial context.

Inhoud vak

The content of the research training is dependent on the specific company at which the training will take place.

Onderwijsvorm

Experimental research project.

Toetsvorm

Written report and oral presentation.

Literatuur

Dependent on the project a literature search will have to be performed to be well prepared for the research training.

Aanbevolen voorkennis

Courses ADMET, Drug-induced stress and cellular signalling, Advanced Course on Drug Disposition and Safety Assessment, or equivalent courses.

Doelgroep

mDDS-DDSA

Overige informatie

Students who want to perform a company training should first ask for approval at the exam committee by sending a short description of the research project and a declaration of the master-coordinator (dr JNM Commandeur; j.n.m.commandeur@vu.nl) in which the procedure is described on how the quality and progress of the research project will be monitored and how the final assessment of the project will be organized (usually based on the experimental performance, a written report and final oral presentation). In case (part of) the company training is confidential, on-site inspection of the written report and oral presentation should be arranged in order to evaluate the academic level.

Company Training DDS Drug, Disp. and Saf. Assessm.

Vakcode	X_432746 ()
Periode	Ac. Jaar (september)
Credits	24.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen

Coördinator	dr. J.N.M. Commandeur
Examinator	dr. J.N.M. Commandeur
Niveau	500

Doel vak

To perform research in the area of molecular and biochemical toxicology and risk assessment in an industrial context.

Inhoud vak

Dependent on the specific company at which the training will take place.

Onderwijsvorm

Experimental research project.

Toetsvorm

Written report and oral presentation.

Literatuur

Dependent on the project a literature search will have to be performed to be well prepared for the research training.

Aanbevolen voorkennis

Courses ADMET, Drug-induced stress and cellular signalling, Advanced Course on Drug Disposition and Safety Assessment, or equivalent courses.

Doelgroep

mDDS-DDSA

Overige informatie

Students who want to perform a company training should first ask for approval at the exam committee by sending a short description of the research project and a declaration of the master-coordinator (dr JNM Commandeur; j.n.m.commandeur@vu.nl) in which the procedure is described on how the quality and progress of the research project will be monitored and how the final assessment of the project will be organized (usually based on the experimental performance, a written report and final oral presentation). In case (part of) the company training is confidential, on-site inspection of the written report and oral presentation should be arranged in order to evaluate the academic level.

Company Training DDS Drug, Disp. and Saf. Assessm.

Vakcode	X_432751 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J.N.M. Commandeur
Examinator	dr. J.N.M. Commandeur
Niveau	500

Doel vak

To perform research in the area of molecular and biochemical toxicology and risk assessment in an industrial context.

Inhoud vak

The content of the research training is dependent on the specific company at which the training will take place.

Onderwijsvorm

Experimental research project.

Toetsvorm

Written report and oral presentation.

Literatuur

Dependent on the project a literature search will have to be performed to be well prepared for the research training.

Aanbevolen voorkennis

Courses ADMET, Drug-induced stress and cellular signalling, Advanced Course on Drug Disposition and Safety Assessment, or equivalent courses.

Doelgroep

mDDS-DDSA

Overige informatie

Students who want to perform a company training should first ask for approval at the exam committee by sending a short description of the research project and a declaration of the master coordinator (dr JNM Commandeur; j.n.m.commandeur@vu.nl) in which the procedure is described on how the quality and progress of the research project will be monitored and how the final assessment of the project will be organized (usually based on the experimental performance, a written report and final oral presentation). In case (part of) the company training is confidential, on-site inspection of the written report and oral presentation should be arranged in order to evaluate the academic level.

Company Training DDS Drug, Disp. and Saf. Assessm.

Vakcode	X_432834 ()
Periode	Ac. Jaar (september)
Credits	36.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J.N.M. Commandeur
Examinator	dr. J.N.M. Commandeur
Niveau	500

Doel vak

To perform research in the area of molecular and biochemical toxicology and risk assessment in an industrial context.

Inhoud vak

The content of the research training is dependent on the specific company at which the training will take place.

Onderwijsvorm

Experimental research project.

Toetsvorm

Written report and oral presentation.

Literatuur

Dependent on the project a literature search will have to be performed to be well prepared for the research training.

Aanbevolen voorkennis

Courses ADMET, Drug-induced stress and cellular signalling, Advanced Course on Drug Disposition and Safety Assessment, or equivalent courses.

Doelgroep

mDDS-DDSA

Overige informatie

Students who want to perform a company training should first ask for approval at the exam committee by sending a short description of the research project and a declaration of the master-coordinator (dr JNM Commandeur; j.n.m.commandeur@vu.nl) in which the procedure is described on how the quality and progress of the research project will be monitored and how the final assessment of the project will be organized (usually based on the experimental performance, a written report and final oral presentation). In case (part of) the company training is confidential, on-site inspection of the written report and oral presentation should be arranged in order to evaluate the academic level.

Company Training Drug Discovery & Target Finding

Vakcode	X_432621 (432621)
Periode	Ac. Jaar (september)
Credits	18.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. D.P. Geerke
Examinator	dr. D.P. Geerke
Niveau	500

Doel vak

To obtain experience in scientific research in an industrial setting.

Inhoud vak

During a trainee-ship the student actively participates in a research project.

Toetsvorm

Practical work, report and presentation.

Doelgroep

mDDS

Overige informatie

Please contact the coordinator well in advance.

Company Training Drug Discovery & Target Finding

Vakcode	X_432747 ()
Periode	Ac. Jaar (september)
Credits	24.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M.H. Siderius
Examinator	dr. M.H. Siderius
Niveau	500

Doel vak

To obtain experience in scientific research in an industrial setting.

Inhoud vak

During a trainee-ship the student actively participates in a research project.

Toetsvorm

Practical work, report and presentation.

Doelgroep

mDDS

Overige informatie

Please contact the coordinator well in advance.

Company Training Drug Discovery & Target Finding

Vakcode	X_432752 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M.H. Siderius
Examinator	dr. M.H. Siderius
Niveau	500

Doel vak

To obtain experience in scientific research in an industrial setting.

During a trainee-ship the student actively participates in a research project.

Practical work, report and presentation.

Inhoud vak

During a trainee-ship the student actively participates in a research project.

Toetsvorm

Practical work, report and presentation.

Doelgroep

mDDS

Overige informatie

Please contact the coordinator well in advance.

Company Training Drug Discovery & Target Finding

Vakcode	X_432836 ()
Periode	Ac. Jaar (september)
Credits	36.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M.H. Siderius
Examinator	dr. M.H. Siderius
Niveau	500

Computer-Aided Drug Design and Virtual Screening

Vakcode	X_432673 (432673)
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. C. de Graaf
Examinator	dr. C. de Graaf
Docent(en)	prof. dr. I.J.P. de Esch, dr. C. de Graaf, dr. D.P. Geerke
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak

Providing theoretical background on computer-aided drug design and virtual screening, and giving an overview of recent developments, applications and trends.

Inhoud vak

Introduction into most important concepts of computer-aided drug discovery and design.

- Protein homology modeling: sequence alignment methods, modeling constraints, protein-ligand interaction model refinement and validation.

- Chemoinformatics and chemogenomics and their application in drug and drug target identification: annotated ligand and protein databases, similarity searches, molecular fingerprints, machine learning, QSAR, focused library design, molecular field analysis, sequence- and

structure-based comparison of binding sites.

- Structure-based virtual screening and design: molecular alignment, pharmacophore modeling, molecular docking and scoring, post-processing filters, protein-ligand interaction fingerprints, de novo design.

Students will learn to recognize the strengths and challenges of different in computer-aided drug design approaches and will learn how in silico methods can be complemented with experimental studies in concrete ligand discovery and design projects.

Onderwijsvorm

Lectures, tutorials, and self-study.

Toetsvorm

Written or oral examination and assignments.

Literatuur

Computer- Assisted Drug Design (Mason (Ed.) (references to relevant paragraphs fromt Mason will be included in lecture handouts and will be available as "E-book" via UBVU).

Background information: Chapters from Leach, A.R., Molecular Modelling: Principles and Applications. (ISBN 0-582-38210-6).

Literature that will be made available via Blackboard.

Doelgroep

mDDS-CMCT, mDDS-DD&S, mDDS-DDSA, mDDS-DDTF, mDDS-C-var, mDDS-E-var, mDDS-M-var, mCh

Density Functional Theory for Chemists

Vakcode	X_435111 (435111)
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. F.M. Bickelhaupt
Examinator	prof. dr. F.M. Bickelhaupt
Niveau	500

Doel vak

Understanding basic concepts of Density Functional Theory (DFT), in particular, Kohn-Sham DFT, and its application to understanding and predicting chemical bonding, molecular structure, and reactivity.

Inhoud vak

Electron density, Hole functions, Electron density as basic variable instead of the wavefunction, Hohenberg-Kohn theorems, Kohn-Sham approach, Approximate exchange-correlation functionals, Basic machinery of DFT computer programs.

Onderwijsvorm

zelfstudie

Toetsvorm

Oral exam

Literatuur

Parts of: (a) W. Koch en M. C. Holthausen, A Chemist's Guide to Density Functional Theory; Sec. Ed.; Wiley-VCH Verlag: Weinheim, 2000.; (b) F.M. Bickelhaupt, E.J. Baerends, Kohn-Sham Density Functional Theory: Predicting and Understanding Chemistry, in: Rev. Comput. Chem.; K.B. Lipkowitz, D.B. Boyd, Eds.; Wiley-VCH: New York, Vol. 15.

Overige informatie

Period: in consultation with the lecturer

Density Functional Theory for Chemists

Vakcode	X_435112 (435112)
Periode	Ac. Jaar (september)
Credits	12.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. F.M. Bickelhaupt
Examinator	prof. dr. F.M. Bickelhaupt
Niveau	500

Doel vak

Understanding basic concepts of Density Functional Theory (DFT), in particular, Kohn-Sham DFT, and its application to understanding and predicting chemical bonding, molecular structure, and reactivity.

Inhoud vak

Part I (6 ECTS): Electron density, Hole functions, Electron density as basic variable instead of the wavefunction, Hohenberg-Kohn theorems, Kohn-Sham approach, Approximate exchange-correlation functionals, Basic machinery of DFT computer programs. Part II (6 ECTS): Molecular structure, Vibrational frequencies, Thermochemistry, Hydrogen bonds, Kohn-Sham molecular orbital (MO) model of the electronic structure and chemical bond, Chemical reactivity.

Onderwijsvorm

zelfstudie

Toetsvorm

Oral examination.

Literatuur

Parts of: (a) W. Koch en M. C. Holthausen, A Chemist's Guide to Density Functional Theory; Sec. Ed.; Wiley-VCH Verlag: Weinheim, 2000.; (b) F.M. Bickelhaupt, E.J. Baerends, Kohn-Sham Density Functional Theory: Predicting and Understanding Chemistry, in: Rev. Comput. Chem.; K.B. Lipkowitz, D.B. Boyd, Eds.; Wiley-VCH: New York, Vol. 15; (c) Other selected tutorial reviews (in consultation).

Doelgroep
mCh, mPhar

Overige informatie

Period: in consultation with the lecturer

Drug Action

Vakcode	X_432724 ()
Periode	Periode 3
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H.F. Vischer
Examinator	dr. H.F. Vischer
Docent(en)	dr. H.F. Vischer
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak

To obtain a general introduction into and deepening of knowledge of fundamental principles and molecular aspects of drug action within the field of molecular pharmacology and receptor biochemistry.

Inhoud vak

Most drugs display their pharmacological actions following the interactions with receptor proteins. As for the molecular pharmacological aspects the mechanisms by which these drugs act with respect to their therapeutic application will be studied. Novel concepts of pharmacology, including constitutive receptor activity, allosteric modulation, receptor dimerization and ligand-biased signaling will be addressed. Aspects of modern technologies, such as high-throughput screening and pharmacogenomics, within the process of drug discovery and target finding will be addressed. Important cellular and animal model systems used to investigate (pathological and pharmacological) aspects of cell biology will be discussed.

Onderwijsvorm

Hoor- en werkcollege en case-study

Toetsvorm

Written examination and assignments.

Literatuur

Pharmacology in Drug Discovery - T.P. Kenakin
ISBN 978-0-12-384856-7

Vereiste voorkennis

Knowledge of basic principles of drug action.

Doelgroep

mDDS

Drug-induced Stress and Cellular Responses

Vakcode	X_432536 (432536)
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J.N.M. Commandeur
Examinator	dr. J.N.M. Commandeur
Docent(en)	dr. J.N.M. Commandeur
Lesmethode(n)	Hoorcollege
Niveau	500

Doel vak

At the end of this theoretical course, the students are aware of the latest insights of cellular stress responses which can occur after exposure of cells to reactive drugs and/or reactive drug metabolites.

Inhoud vak

Exposure of tissues to high levels of drugs and/or drug metabolites in some cases can trigger various biochemical responses. Interaction with sensor proteins can lead to adaptative stress responses which will protect the cell against further damage. If these adaptative stress responses are insufficient, interaction with critical proteins may lead to cell death or exaggerated, fatal pharmacological responses.

The following aspects will be studied in the course drug-induced stress and cellular signaling:

- (types of) adverse drug reactions
- role of biotransformation and drug transport in adverse drug reactions,
- reversible and irreversible interactions of toxic drugs with biological macromolecules,
- cellular adaptation to exposure to reactive intermediates and reactive oxygen species;
- cellular and molecular mechanisms leading to toxic effects,
- genetic toxicology and chemical carcinogenesis,
- role of mitochondria in necrosis and apoptosis,
- impairment of cell proliferation and tissue repair,
- immune-mediated toxicity.

Onderwijsvorm

Lectures and self study.

Toetsvorm

Written exam

Literatuur

Boelsterli, Mechanistic Toxicology: The Molecular Basis of How Chemicals Disrupt Biological Targets 2nd ed, CRC Press, 2007 (ISBN 0849372720).

Vereiste voorkennis

Bachelor Physics, Chemistry, Mathematics, Biology, Medical Biology
Pharmaceutical Sciences, Medical Natural Science Biomolecular Science
portal course, or equivalent

Entrepreneurship in Health and Life Sciences

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

Doel vak

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

Learning objectives

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

Inhoud vak

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

analysis of the innovation. Also a paragraph on CSR aspect should be added. The final part of the assignment is your own feasibility study: how would you valorize the innovation to the market?

Onderwijsvorm

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

Schedule and study time

The total study time is 160 hours.

Tuition methods include lectures, consultancies and self-study.

The different elements have the following study time:

- lectures 18 hours
- consultancies 8 hours
- writing feasibility plan 65 hours
- self study 65 hours
- examination 4 hours

Toetsvorm

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

Literatuur

To be announced on Blackboard

Doelgroep

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

Overige informatie

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

anna.van.luijn@falw.vu.nl

Ethics and Academic skills

Vakcode	X_432725 ()
Periode	Ac. Jaar (september)
Credits	1.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. ir. R.V.A. Orru
Examinator	prof. dr. ir. R.V.A. Orru
Niveau	400

Doel vak

In order to plan this course please contact your mastercoordinator for details

Ethics and Academic skills

Vakcode	X_432726 ()
Periode	Ac. Jaar (september)
Credits	2.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. ir. R.V.A. Orru
Examinator	prof. dr. ir. R.V.A. Orru
Niveau	400

Doel vak

In order to plan this course please contact your mastercoordinator for details

Ethics and Academic Skills

Vakcode	X_437556 (437556)
Periode	Ac. Jaar (september)
Credits	6.0
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. ir. R.V.A. Orru
Examinator	prof. dr. ir. R.V.A. Orru
Niveau	400

Doel vak

In order to plan this course please contact your mastercoordinator for details

Ethics and Academic Skills

Vakcode	X_432517 (432517)
Periode	Ac. Jaar (september)
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. ir. R.V.A. Orru
Examinator	prof. dr. ir. R.V.A. Orru
Niveau	400

Doel vak

In order to plan this course please contact your mastercoordinator for details

Inhoud vak

Period: Variable

Ethics in Life Sciences

Vakcode	AM_470707 ()
Periode	Periode 3

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

Doel vak

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

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

Inhoud vak

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

Onderwijsvorm

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

The total study time is 80 hours.

The different elements have the following study time:

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

Please note that attendance to the work group meetings is compulsory. Attendance to the lectures is highly recommended. In our experience, relying on self-study alone is insufficient to apply the theory of the lectures in the assignments of the workgroups, and to pass the exam.

Toetsvorm

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

Literatuur

Available on Blackboard

Vereiste voorkennis

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

Doelgroep

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

Overige informatie

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

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

High-Throughput Screening

Vakcode	X_435047 (435047)
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J. Kool
Examinator	dr. J. Kool
Docent(en)	dr. J. Kool
Lesmethode(n)	Hoorcollege
Niveau	500

Doel vak

In depth study on the bio-analytical and screening aspects related to target and lead discovery of drugs.

Inhoud vak

During this course the potential of modern analytical and biological screening techniques used in target, hit and lead discovery will be discussed. The emphasis will be on the treatment of advanced sample preparation techniques (i.e. automation, high-throughput / combinatorial chemistry, miniaturization), biological and immunological high throughput screening assays and advanced separation methods. Also, the so called "Omics" will be discussed (e.g. proteomics and metabolomics). These techniques will be discussed in relation with pharmacokinetic studies and the applicability of the various techniques within the various stages of target discovery, hit screening, ADME(tox), and early lead discovery. Finally, miniaturization approaches will be dealt with.

Onderwijsvorm

The course starts with a thorough explanation on all subjects that will be discussed, and during which lecture. During the lectures, relevant literature per lecture will be mentioned. This literature is mainly from e-books (chapters) and from academic papers/reviews. All literature that will be mentioned can be found in the course documents on BlackBoard. All this literature has to be studied for the oral examination. All

students will work on an assignment related to a topic in high throughput screening. This assignment results in a document and a PowerPoint presentation of 8 minutes.

Toetsvorm

Examination is in the form of an oral or written examination accounting for 50% of the final mark (depending on the number of students entering the course). All lectures and all literature provided are included in the examination. All material to be studied and learned for the examination can be accessed during the examination. Students can take all printed material and/or a computer with them during the examination. De presentation of 8 minutes followed by questions and replies to these questions constitutes 25% of the final mark. The Document's topic and the presentation's topic are related to each other. The document is between 6 and 8 pages (Times New Roman type 12; line spacing 1) including title page and with a maximum of 4 Figures/Tables. The assignment document constitutes the other 25% of the final mark. The marks of the examination, the presentation and discussion afterwards, and the assignment document all have to be sufficient (6.0). (If more than 12 students join this course, students will form groups of two students. In that case, the presentations will be given by both students per group and each presentation has a duration of 12 minutes. The document is then between 10 and 14 pages (Times New Roman type 12; line spacing 1) including title page and with a maximum of 6 Figures/Tables. The oral examination will then still be on individual basis).

Literatuur

Please see the Course Documents on BlackBoard. The PowerPoint presentation named "HTS Course Overview" gives a detailed explanation/overview of the lectures, tutorials and course structure. All PowerPoint lectures will be placed on BlackBoard at least one day before each lecture. All PDF e-book chapters and other literature (e.g. academic research papers and reviews) can already be found on BlackBoard. It will be announced when each PDF literature is/are to be read in order to prepare for a respective lecture.

Aanbevolen voorkennis

Basic knowledge of biochemistry, separation sciences, spectroscopy and mass spectrometry.

Doelgroep

mCh-AS, mCh-MDSC, mDDS-BCCA, mDDS-DDTF

History of Life Sciences

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

Doel vak

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

Inhoud vak

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

Onderwijsvorm

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

Toetsvorm

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

Literatuur

Articles

Overige informatie

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

Internship abroad DDS Biomol. Drug Analysis

Vakcode	X_432674 (432674)
Periode	Ac. Jaar (september)
Credits	18.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H. Lingeman
Examinator	dr. H. Lingeman
Niveau	500

Doel vak

To acquire knowledge and insight into the role and objective of drug, bio-analytical and clinical development processes in industry and research institutes.

Inhoud vak

This project aims to provide students with a theoretical and practical understanding of the issues involved in the design, conduct, analyses and interpretation of analytical studies.

Doelgroep

mDDS

Overige informatie

For further information please contact Henk Lingeman.

Internship abroad DDS Biomol. Drug Analysis

Vakcode	X_432753 ()
Periode	Ac. Jaar (september)
Credits	24.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H. Lingeman
Examinator	dr. H. Lingeman
Niveau	500

Doel vak

To acquire knowledge and insight into the role and objective of drug, bio-analytical and clinical development processes in industry, and research institutes.

Inhoud vak

This project aims to provide student with a theoretical and practical understanding of the issues involved in the design, conduct, analyses and interpretation of analytical studies.

Doelgroep

mDDS

Overige informatie

For further information please contact Henk Lingeman.

Internship abroad DDS Biomol. Drug Analysis

Vakcode	X_432758 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H. Lingeman
Examinator	dr. H. Lingeman
Niveau	500

Doel vak

To acquire knowledge and insight into the role and objective of drug, bio-analytical and clinical development processes in industry and research

institutes.

Inhoud vak

This project aims to provide students with a theoretical and practical understanding of the issues involved in the design, conduct, analyses and interpretation of analytical studies.

Doelgroep

mDDS

Overige informatie

For further information please contact Henk Lingeman.

Internship abroad DDS Biomol. Drug Analysis

Vakcode	X_432837 ()
Periode	Ac. Jaar (september)
Credits	36.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H. Lingeman
Examinator	dr. H. Lingeman
Niveau	500

Doel vak

To acquire knowledge and insight into the role and objective of drug, bioanalytical and clinical development processes.

Inhoud vak

This project aims to provide student with a theoretical and practical understanding of the issues involved in the design, conduct, analysis and interpretation of analytical studies.

Doelgroep

mDDS

Internship abroad DDS Comp. Med. Chem. & Tox.

Vakcode	X_432675 (432675)
Periode	Ac. Jaar (september)
Credits	18.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. D.P. Geerke
Examinator	dr. D.P. Geerke
Niveau	500

Doel vak

To obtain experience in doing scientific research in another country.

Inhoud vak

During a traineeship, the student actively participates in a research project within a university or company in another country.

Toetsvorm

Report, presentation and practical work.

Doelgroep

mDDS

Overige informatie

Please contact the coordinator well in advance to check for possibilities and to discuss the most suitable duration of the traineeship.

Internship abroad DDS Comp. Med. Chem. & Tox.

Vakcode	X_432754 ()
Periode	Ac. Jaar (september)
Credits	24.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. D.P. Geerke
Examinator	dr. D.P. Geerke
Niveau	500

Doel vak

To obtain experience in doing scientific research in another country.

Inhoud vak

During a traineeship, the student actively participates in a research project within a university or company in another country.

Toetsvorm

Report, presentation and practical work.

Doelgroep

mDDS

Overige informatie

Please contact the coordinator well in advance to check for possibilities and to discuss the most suitable duration of the traineeship.

Internship abroad DDS Comp. Med. Chem. & Tox.

Vakcode	X_432759 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. D.P. Geerke
Examinator	dr. D.P. Geerke
Niveau	500

Doel vak

To obtain experience in doing scientific research in another country.

Inhoud vak

During a traineeship, the student actively participates in a research project within a university or company in another country.

Toetsvorm

Report, presentation and practical work.

Doelgroep

mDDS

Overige informatie

Please contact the coordinator well in advance to check for possibilities and to discuss the most suitable duration of the traineeship.

Internship abroad DDS Comp. Med. Chem. & Tox.

Vakcode	X_432838 ()
Periode	Ac. Jaar (september)
Credits	36.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. D.P. Geerke
Examinator	dr. D.P. Geerke
Niveau	500

Internship abroad DDS Drug Design & Synth.

Vakcode	X_432676 (432676)
Periode	Ac. Jaar (september)
Credits	18.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M. Wijtmans
Examinator	dr. M. Wijtmans
Niveau	500

Doel vak

To obtain experience in doing scientific research in another country.

Inhoud vak

During a traineeship, the student actively participates in a research project within a university or company in another country.

Toetsvorm

Report, presentation and practical work.

Doelgroep

mDDS

Intekenprocedure

Please contact the coordinator well in advance to check for possibilities and to discuss the most suitable duration of the traineeship.

Internship abroad DDS Drug Design & Synth.

Vakcode	X_432755 ()
Periode	Ac. Jaar (september)
Credits	24.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M. Wijtmans
Examinator	dr. M. Wijtmans
Niveau	500

Doel vak

To obtain experience in doing scientific research in another country.

Inhoud vak

During a traineeship, the student actively participates in a research project within a university or company in another country.

Toetsvorm

Report, presentation and practical work.

Doelgroep

mDDS

Intekenprocedure

Please contact the coordinator well in advance to check for possibilities and to discuss the most suitable duration of the traineeship.

Internship abroad DDS Drug Design & Synth.

Vakcode	X_432760 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M. Wijtmans
Examinator	dr. M. Wijtmans
Niveau	500

Doel vak

To obtain experience in doing scientific research in another country.

Inhoud vak

During a traineeship, the student actively participates in a research project within a university or company in another country.

Toetsvorm

Report, presentation and practical work.

Doelgroep

mDDS

Intekenprocedure

Please contact the coordinator well in advance to check for possibilities and to discuss the most suitable duration of the traineeship.

Internship abroad DDS Drug Design & Synth.

Vakcode	X_432839 ()
Periode	Ac. Jaar (september)
Credits	36.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M. Wijtmans
Examinator	dr. M. Wijtmans
Niveau	500

Doel vak

To obtain experience in doing scientific research in another country.

Inhoud vak

During a traineeship, the student actively participates in a research project within a university or company in another country.

Toetsvorm

Report, presentation and practical work.

Doelgroep

mDDS

Intekenprocedure

Please contact the coordinator well in advance to check for possibilities and to discuss the most suitable duration of the traineeship.

Internship abroad DDS Drug Disc. & Target Find.

Vakcode	X_432678 (432678)
Periode	Ac. Jaar (september)
Credits	18.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M.H. Siderius

Examinator	dr. M.H. Siderius
Niveau	500

Doel vak

To obtain experience in scientific research abroad.

Inhoud vak

During an internship the student actively participates in a research project within an institute or a company abroad.

Toetsvorm

Practical work, report and presentation.

Doelgroep

mDDS

Overige informatie

Please contact the coordinator well in advance.

Internship abroad DDS Drug Disc. & Target Find.

Vakcode	X_432757 ()
Periode	Ac. Jaar (september)
Credits	24.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M.H. Siderius
Examinator	dr. M.H. Siderius
Niveau	500

Doel vak

To obtain experience in scientific research abroad.

Inhoud vak

During an internship the student actively participates in a research project within an institute or a company abroad.

Toetsvorm

Practical work, report and presentation.

Doelgroep

mDDS

Overige informatie

Please contact the coordinator well in advance.

Internship abroad DDS Drug Disc. & Target Find.

Vakcode	X_432762 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen

Coördinator	dr. M.H. Siderius
Examinator	dr. M.H. Siderius
Niveau	500

Doel vak

To obtain experience in scientific research abroad.

Inhoud vak

During an internship the student actively participates in a research project within an institute or a company abroad.

Toetsvorm

Practical work, report and presentation.

Doelgroep

mDDS

Overige informatie

Please contact the coordinator well in advance.

Internship abroad DDS Drug Disc. & Target Find.

Vakcode	X_432840 ()
Periode	Ac. Jaar (september)
Credits	36.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M.H. Siderius
Examinator	dr. M.H. Siderius
Niveau	500

Internship abroad DDS Drug, Disp. and Saf. Assessm.

Vakcode	X_432677 (432677)
Periode	Ac. Jaar (september)
Credits	18.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J.N.M. Commandeur
Examinator	dr. J.N.M. Commandeur
Niveau	500

Doel vak

To perform research in the area of molecular and biochemical toxicology and to get familiar with experimental approaches used in this field.

To define a hypothesis based on previous observations or publications, and to design, execute and critically interpret the experiments performed to test specific hypotheses.

Inhoud vak

The research project will be carried out in a research group which is active in the area of molecular and biochemical toxicology. Generally, research can focussed on the role of drug transporters and drug metabolising enzymes in the bioactivation and bioinactivation of toxic drugs and other chemicals, identification of genetically determined enzymes, drug-drug interactions, the identification of reactive intermediates and cellular targets of reactive intermediates, cellular responses related to cytotoxicity or adaptation reactions, mechanisms of genotoxicity (mutagenicity, carcinogenicity), idiosyncratic drug reactions, identification of biomarkers for early and late toxic effects, etc.

Onderwijsvorm

Experimental research project, starting with a brief literature survey on the topic to be investigated.

Toetsvorm

Written report, (participation to) work discussions, and oral presentation in the section of Molecular Toxicology.

Literatuur

Relevant reviews will be provided at the start of the project.

Aanbevolen voorkennis

Courses ADMET, Drug-induced stress and cellular signalling or equivalent courses.

Doelgroep

mDDS-DDSA

Overige informatie

Students who want to perform an internship abroad should first ask for approval at the exam committee by sending a short description of the research project and a declaration of the mastercoordinator (dr JNM Commandeur; j.n.m.commandeur@vu.nl) in which the procedure on how the quality and progress of the research project will be monitored and how the final assessment of the project will be organized (usually based on the experimental performance, a written report and final oral presentation).

Internship abroad DDS Drug, Disp. and Saf. Assessm.

Vakcode	X_432756 ()
Periode	Ac. Jaar (september)
Credits	24.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J.N.M. Commandeur
Examinator	dr. J.N.M. Commandeur
Niveau	500

Doel vak

To perform research in the area of molecular and biochemical toxicology and to get familiar with experimental approaches used in this field.

To define a hypothesis based on previous observations or publications, and to design, execute and critically interpret the experiments performed to test specific hypotheses.

Inhoud vak

The research project will be carried out in a research group which is active in the area of molecular and biochemical toxicology. Generally, research can be focused on the role of drug transporters and drug metabolising enzymes in the bioactivation and bioinactivation of toxic drugs and other chemicals, identification of genetically determined enzymes, drug-drug interactions, the identification of reactive intermediates and cellular targets of reactive intermediates, cellular responses related to cytotoxicity or adaptation reactions, mechanisms of genotoxicity (mutagenicity, carcinogenicity), idiosyncratic drug reactions, identification of biomarkers for early and late toxic effects, etc.

Onderwijsvorm

Experimental research project, starting with a brief literature survey on the topic to be investigated.

Toetsvorm

Written report, (participation to) work discussions, and oral presentation.

Literatuur

Relevant reviews will be provided at the start of the project.

Aanbevolen voorkennis

Courses ADMET, Drug-induced stress and cellular signalling, Advanced Course on Drug Disposition and Safety Assessment, or equivalent courses.

Doelgroep

mDDS-DDSA

Overige informatie

Students who want to perform an internship abroad should first ask for approval at the exam committee by sending a short description of the research project and a declaration of the mastercoordinator (dr JNM Commandeur; j.n.m.commandeur@vu.nl) in which the procedure is described on how the quality and progress of the research project will be monitored and how the final assessment of the project will be organized (usually based on the experimental performance, a written report and final oral presentation).

Internship abroad DDS Drug, Disp. and Saf. Assessm.

Vakcode	X_432761 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J.N.M. Commandeur
Examinator	dr. J.N.M. Commandeur
Niveau	500

Doel vak

To perform research in the area of molecular and biochemical toxicology and to get familiar with experimental approaches used in this field.

To define a hypothesis based on previous observations or publications, and to design, execute and critically interpret the experiments performed to test specific hypotheses.

Inhoud vak

The research project will be carried out in a research group which is active in the area of molecular and biochemical toxicology.

Generally, research can focussed on the role of drug transporters and drug metabolising enzymes in the bioactivation and bioinactivation of toxic drugs and other chemicals, identification of genetically determined enzymes, drug-drug interactions, the identification of reactive intermediates and cellular targets of reactive intermediates, cellular responses related to cytotoxicity or adaptation reactions, mechanisms of genotoxicity (mutagenicity, carcinogenicity), idiosyncratic drug reactions, identification of biomarkers for early and late toxic effects, etc.

Onderwijsvorm

Experimental research project, starting with a brief literature survey on the topic to be investigated.

Toetsvorm

Written report, (participation to) work discussions, and oral presentation.

Literatuur

Relevant reviews will be provided at the start of the project.

Aanbevolen voorkennis

Courses ADMET, Drug-induced stress and cellular signalling, Advanced Course on Drug Disposition and Safety Assessment, or equivalent courses.

Doelgroep

mDDS-DDSA

Overige informatie

Students who want to perform an internship abroad should first ask for approval at the exam committee by sending a short description of the research project and a declaration of the mastercoordinator (dr JNM Commandeur; j.n.m.commandeur@vu.nl) in which the procedure is described on how the quality and progress of the research project will be monitored and how the final assessment of the project will be organized (usually based on the experimental performance, a written report and final oral presentation).

Internship abroad DDS Drug, Disp. and Saf. Assessm.

Vakcode	X_432841 ()
Periode	Ac. Jaar (september)
Credits	36.0
Voertaal	Engels

Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J.N.M. Commandeur
Examinator	dr. J.N.M. Commandeur
Niveau	500

Doel vak

To perform research in the area of molecular and biochemical toxicology and to get familiar with experimental approaches used in this field.

To define a hypothesis based on previous observations or publications, and to design, execute and critically interpret the experiments performed to test specific hypotheses.

Inhoud vak

The research project will be carried out in a research group which is active in the area of molecular and biochemical toxicology.

Generally, research can focussed on the role of drug transporters and drug metabolising enzymes in the bioactivation and bioinactivation of toxic drugs and other chemicals, identification of genetically determined enzymes, drug-drug interactions, the identification of reactive intermediates and cellular targets of reactive intermediates, cellular responses related to cytotoxicity or adaptation reactions, mechanisms of genotoxicity (mutagenicity, carcinogenicity), idiosyncratic drug reactions, identification of biomarkers for early and late toxic effects, etc.

Onderwijsvorm

Experimental research project, starting with a brief literature survey on the topic to be investigated.

Toetsvorm

Written report, (participation to) work discussions, and oral presentation.

Literatuur

Relevant reviews will be provided at the start of the project.

Aanbevolen voorkennis

Courses ADMET, Drug-induced stress and cellular signalling, Advanced Course on Drug Disposition and Safety Assessment, or equivalent courses.

Doelgroep

mDDS-DDSA

Overige informatie

Students who want to perform an internship abroad should first ask for approval at the exam committee by sending a short description of the research project and a declaration of the mastercoordinator (dr JNM Commandeur; j.n.m.commandeur@vu.nl) in which the procedure is described on how the quality and progress of the research project will be monitored and how the final assessment of the project will be organized (usually based on the experimental performance, a written report and final oral presentation).

Internship Communication Specialisation

Vakcode	AM_471148 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. J.F.H. Kupper
Examinator	dr. J.F.H. Kupper
Niveau	600

Doel vak

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

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

Inhoud vak

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

Onderwijsvorm

Work placement, under supervision of VU-staff.

Toetsvorm

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

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

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

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

- the attitude of the student
- the execution of the reflective practice placement

- the final report/article
- the oral presentation

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

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

Vereiste voorkennis

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

The student has passed the following courses:

AM_470582, Qualitative and Quantitative Research Methods

AM_470587, Science and Communication

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

AM_470572, 6EC, Communication, Organization and Management

AM_1002, 6EC, Science in Dialogue

AM_471014, 6EC, Science Journalism

AM_470590, 6EC, Science Museology

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

Doelgroep

Students from the MSc Biology to specialize in Communication

Intekenprocedure

The research proposal is approved by the placement coordinator and the VU-supervisor, after which the application has to be approved by the masters' coordinator in advance (on behalf of the examination board).

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

Overige informatie

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

Internship Societal Specialisation

Vakcode	AM_471147 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels

Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. R.J. van Belle-van den Berg
Examinator	dr. R.J. van Belle-van den Berg
Niveau	600

Literature thesis and Colloquium

Vakcode	X_432577 (432577)
Periode	Ac. Jaar (september)
Credits	12.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H. Lingeman
Examinator	dr. H. Lingeman
Niveau	600

Doel vak

Literature study on a topic related to biomolecular analysis.

Inhoud vak

The topic will be chosen in close cooperation and with approval of the master coordinator.

Onderwijsvorm

Selfstudy and discussion sessions.

Toetsvorm

Report and presentation.

Doelgroep

mDDS

Overige informatie

Please contact the coördinator.

Literature thesis and Colloquium CMCT

Vakcode	X_432576 (432576)
Periode	Ac. Jaar (september)
Credits	12.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. D.P. Geerke
Examinator	dr. D.P. Geerke
Niveau	600

Doel vak

To be able to efficiently retrieve in-depth information about a given scientific topic, logically categorize and describe the information in a thesis, and present the main findings in a colloquium.

Inhoud vak

Completion of an academic MSc degree does not only imply practical experience and knowledge from the scientific specialization, it also implies that one is able to deal with substantial amounts of scientific information in an efficient way and distill this into the main points.

During the literature thesis, the student will collect recent in-depth scientific literature about a given research topic, usually a topic of direct interest to the research group. The literature information is described in a coherent form in a thesis, which is also presented orally during a colloquium.

Onderwijsvorm

Self-study, contact hours with supervisor.

Toetsvorm

Thesis, colloquium.

Doelgroep

mDDS-CMCT

Overige informatie

Please contact the coordinator in advance for a discussion and planning of the topic.

Literature thesis and Colloquium DDS Medical Chemistry, DD&S

Vakcode	X_432573 (432573)
Periode	Ac. Jaar (september)
Credits	12.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M. Wijtmans
Examinator	dr. M. Wijtmans
Niveau	600

Doel vak

To be able to efficiently retrieve in-depth information about a given scientific topic, logically categorize and describe the information in a thesis, and present the main findings in a colloquium.

Inhoud vak

Completion of an academic MSc degree does not only imply practical experience and knowledge from the scientific specialisation, it also implies that one is able to deal with substantial amounts of scientific information in an efficient way and distill this into the main points.

During the literature thesis, the student will collect recent in-depth scientific literature about a given Medicinal Chemistry research topic, usually a topic of direct interest to the research group. The literature information is described in a coherent form in a thesis, which is also presented orally during a colloquium.

Onderwijsvorm

Self-study, contact hours with supervisor.

Toetsvorm

Thesis, colloquium.

Literatuur

A guide with general hints and tips on writing a thesis will be provided.

Doelgroep

mDDS-DD&S

Intekenprocedure

Please contact the coordinator in advance for a discussion and planning of the topic.

Literature thesis and Colloquium DDS Molecular Toxicology, DDSA

Vakcode	X_432575 (432575)
Periode	Ac. Jaar (september)
Credits	12.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J.N.M. Commandeur
Examinator	dr. J.N.M. Commandeur
Niveau	600

Doel vak

To demonstrate that the student is able to collect relevant and recent primary scientific literature on a predefined subject in the area of molecular and biochemical toxicology, to organize the information in chapters and to draw conclusions on the perspectives or relevance of the subject.

Inhoud vak

The content of the literature thesis/colloquium depends on the subject which will be selected in consultation with master coordinator dr. JNM Commandeur (j.n.m.commandeur@vu.nl).

Onderwijsvorm

Literature study

Toetsvorm

Written literature thesis and oral presentation (colloquium) for the department of Pharmaceutical Sciences.

Aanbevolen voorkennis

The courses ADMET and Drug-induced stress and cellular responses or equivalent courses.

Doelgroep

mDDS-DDSA

Overige informatie

A list of subjects for the literature thesis and colloquium can be obtained from dr. JNM Commandeur (j.n.m.commandeur@vu.nl).

Major Research Project Biomol. Drug Analysis

Vakcode	X_432564 (432564)
Periode	Ac. Jaar (september)
Credits	42.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H. Lingeman
Examinator	dr. H. Lingeman
Niveau	600

Doel vak

To acquire knowledge and insight into the role and objective of drug, bioanalytical and clinical development processes in complex samples using LC-MS and bio-assay-MS based approaches.

Inhoud vak

This project aims to provide the student with a theoretical and practical understanding of the issues involved in the design, conduct, analyses and interpretation of complex analytical studies.

Doelgroep

mDDS-BDA

Overige informatie

For further information please contact Henk Lingeman.

Major Research Project Biomol. Drug Analysis

Vakcode	X_432567 (432567)
Periode	Ac. Jaar (september)
Credits	48.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H. Lingeman
Examinator	dr. H. Lingeman
Niveau	600

Doel vak

To acquire knowledge and insight into the role and objective of drug, bio-analytical and clinical development processes in complex samples using LC-MS and bio-assay-MS based approaches.

Inhoud vak

This project aims to provide the student with a theoretical and practical understanding of the issues involved in the design, conduct, analyses and interpretation of complex analytical studies.

Doelgroep

mDDS-BDA

Overige informatie

For further information please contact Henk Lingeman.

Major Research Project Biomol. Drug Analysis

Vakcode	X_432568 (432568)
Periode	Ac. Jaar (september)
Credits	54.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H. Lingeman
Examinator	dr. H. Lingeman
Niveau	600

Doel vak

To acquire knowledge and insight into the role and objective of drug, bio-analytical and clinical development processes in complex samples using LC-MS and bio-assay-MS based approaches.

Inhoud vak

This project aims to provide the student with a theoretical and practical understanding of the issues involved in the design, conduct, analyses and interpretation of complex analytical studies.

Doelgroep

mDDS-BDA

Overige informatie

For further information please contact Henk Lingeman.

Major Research Project Biomol. Drug Analysis

Vakcode	X_432569 (432569)
Periode	Ac. Jaar (september)
Credits	60.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H. Lingeman
Examinator	dr. H. Lingeman
Niveau	600

Doel vak

To acquire knowledge and insight into the role and objective of drug, bio-analytical and clinical development processes in complex samples using LC-MS and bio-assay-MS based approaches.

Inhoud vak

This project aims to provide the student with a theoretical and practical understanding of the issues involved in the design, conduct, analyses and interpretation of complex analytical studies.

Doelgroep
mDDS-BDA

Overige informatie

For further information please contact Henk Lingeman.

Major Research Project DDS Biomolecular Drug Analysis (C,E,M)

Vakcode	X_432727 ()
Periode	Ac. Jaar (september)
Credits	24.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H. Lingeman
Examinator	dr. H. Lingeman
Niveau	600

Doel vak

To acquire knowledge and insight into the role and objective of drug, bio-analytical and clinical development processes in complex samples using LC-MS and bio-assay-MS base approaches.

Inhoud vak

This project aims to provide the student with a theoretical and practical understanding of the issues involved in the design, conduct, analyses and interpretation of complex analytical studies.

Doelgroep
mDDS-BDA

Overige informatie

For further information please contact Henk Lingeman.

Major Research Project DDS Medicinal Chemistry, DD&S

Vakcode	X_432728 ()
Periode	Ac. Jaar (september)
Credits	24.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M. Wijtmans
Examinator	dr. M. Wijtmans
Niveau	600

Doel vak

To obtain experience in design and/or synthesis techniques and in doing scientific research.

Inhoud vak

Within medicinal chemistry research, computational chemistry and organic synthesis play a major role in designing and preparing small organic

ligands as e.g. protein modulators. During the traineeship, the student actively participates in a research project at e.g. the VU Drug Design and Synthesis laboratories and as such contributes to new scientific results. The focus can be on organic synthesis, on drug design, or on both. Attention will be paid to setting up research experiments, using state-of-the-art experimental techniques, analyzing experimental results and keeping adequate documentation. In all, the student will get exposed to the joys of doing research as well as to exciting contemporary synthetic and/or design techniques.

The student will twice report on the research progress in an oral presentation. The traineeship is completed with a written report.

Toetsvorm

Presentation, report, practical work.

Literatuur

Will be provided by the supervisor. The first 1-2 weeks of the traineeship will be spent on literature reading.

Vereiste voorkennis

Entry requirements with respect to courses likely apply. Ask the coordinator well in advance.

Doelgroep

mDDS-DD&S

Intekenprocedure

Please contact the coordinator well in advance.

Major Research Project DDS Medicinal Chemistry, DD&S

Vakcode	X_432509 (432509)
Periode	Ac. Jaar (september)
Credits	42.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M. Wijtmans
Examinator	dr. M. Wijtmans
Niveau	600

Doel vak

To obtain experience in design and/or synthesis techniques and in doing scientific research.

Inhoud vak

Within medicinal chemistry research, computational chemistry and organic synthesis play a major role in designing and preparing small organic ligands as e.g. protein modulators. During the traineeship, the student actively participates in a research project at e.g. the VU Drug Design and Synthesis laboratories and as such contributes to new scientific results. The focus can be on organic synthesis, on drug design, or on both. Attention will be paid to setting up research experiments, using state-of-the-art experimental techniques, analyzing experimental results and keeping adequate documentation. In all, the student will get exposed to the joys of doing research as well as to exciting contemporary

synthetic and/or design techniques.

The student will twice report on the research progress in an oral presentation. The traineeship is completed with a written report.

Toetsvorm

Presentation, report, practical work.

Literatuur

Will be provided by the supervisor. The first 1-2 weeks of the traineeship will be spent on literature reading.

Vereiste voorkennis

Entry requirements with respect to courses likely apply. Ask the coordinator well in advance.

Doelgroep

mDDS-DD&S

Intekenprocedure

Please contact the coordinator well in advance.

Overige informatie

There are four variants of this traineeship. Extension of the traineeship up to 60 ECTS can be incorporated as part of the optional part of the MSc program.

X_432509: 42 ECTS

X_432544: 48 ECTS

X_432545: 54 ECTS

X_432546: 60 ECTS

Major Research Project DDS Medicinal Chemistry, DD&S

Vakcode	X_432544 (432544)
Periode	Ac. Jaar (september)
Credits	48.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M. Wijtmans
Examinator	dr. M. Wijtmans
Niveau	600

Doel vak

To obtain experience in design and/or synthesis techniques and in doing scientific research.

Inhoud vak

Within medicinal chemistry research, computational chemistry and organic synthesis play a major role in designing and preparing small organic ligands as e.g. protein modulators. During the traineeship, the student actively participates in a research project at e.g. the VU Drug Design and Synthesis laboratories and as such contributes to new scientific results. The focus can be on organic synthesis, on drug design, or on both. Attention will be paid to setting up research experiments, using state-of-the-art experimental techniques, analyzing experimental results and keeping adequate documentation. In all, the student will get exposed

to the joys of doing research as well as to exciting contemporary synthetic and/or design techniques.

The student will twice report on the research progress in an oral presentation. The traineeship is completed with a written report.

Toetsvorm

Presentation, report, practical work.

Literatuur

Will be provided by the supervisor. The first 1-2 weeks of the traineeship will be spent on literature reading.

Vereiste voorkennis

Entry requirements with respect to courses likely apply. Ask the coordinator well in advance.

Doelgroep

mDDS-DD&S

Intekenprocedure

Please contact the coordinator well in advance.

Overige informatie

There are four variants of this traineeship. Extension of the traineeship up to 60 ECTS can be incorporated as part of the optional part of the MSc program.

X_432509: 42 ECTS

X_432544: 48 ECTS

X_432545: 54 ECTS

X_432546: 60 ECTS

Major Research Project DDS Medicinal Chemistry, DD&S

Vakcode	X_432545 (432545)
Periode	Ac. Jaar (september)
Credits	54.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M. Wijtmans
Examinator	dr. M. Wijtmans
Niveau	600

Doel vak

To obtain experience in design and/or synthesis techniques and in doing scientific research.

Inhoud vak

Within medicinal chemistry research, computational chemistry and organic synthesis play a major role in designing and preparing small organic ligands as e.g. protein modulators. During the traineeship, the student actively participates in a research project at e.g. the VU Drug Design and Synthesis laboratories and as such contributes to new scientific results. The focus can be on organic synthesis, on drug design, or on both. Attention will be paid to setting up research experiments, using state-of-the-art experimental techniques, analyzing experimental results

and keeping adequate documentation. In all, the student will get exposed to the joys of doing research as well as to exciting contemporary synthetic and/or design techniques.

The student will twice report on the research progress in an oral presentation. The traineeship is completed with a written report.

Toetsvorm

Presentation, report, practical work.

Literatuur

Will be provided by the supervisor. The first 1-2 weeks of the traineeship will be spent on literature reading.

Vereiste voorkennis

Entry requirements with respect to courses likely apply. Ask the coordinator well in advance.

Doelgroep

mDDS-DD&S

Intekenprocedure

Please contact the coordinator well in advance.

Overige informatie

There are four variants of this traineeship. Extension of the traineeship up to 60 ECTS can be incorporated as part of the optional part of the MSc program.

X_432509: 42 ECTS

X_432544: 48 ECTS

X_432545: 54 ECTS

X_432546: 60 ECTS

Major Research Project DDS Medicinal Chemistry, DD&S

Vakcode	X_432546 (432546)
Periode	Ac. Jaar (september)
Credits	60.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M. Wijtmans
Examinator	dr. M. Wijtmans
Niveau	600

Doel vak

To obtain experience in design and/or synthesis techniques and in doing scientific research.

Inhoud vak

Within medicinal chemistry research, computational chemistry and organic synthesis play a major role in designing and preparing small organic ligands as e.g. protein modulators. During the traineeship, the student actively participates in a research project at e.g. the VU Drug Design and Synthesis laboratories and as such contributes to new scientific results. The focus can be on organic synthesis, on drug design, or on both. Attention will be paid to setting up research experiments, using

state-of-the-art experimental techniques, analyzing experimental results and keeping adequate documentation. In all, the student will get exposed to the joys of doing research as well as to exciting contemporary synthetic and/or design techniques.

The student will twice report on the research progress in an oral presentation. The traineeship is completed with a written report.

Toetsvorm

Presentation, report, practical work.

Literatuur

Will be provided by the supervisor. The first 1-2 weeks of the traineeship will be spent on literature reading.

Vereiste voorkennis

Entry requirements with respect to courses likely apply. Ask the coordinator well in advance.

Doelgroep

mDDS-DD&S

Intekenprocedure

Please contact the coordinator well in advance.

Overige informatie

There are four variants of this traineeship. Extension of the traineeship up to 60 ECTS can be incorporated as part of the optional part of the MSc program.

X_432509: 42 ECTS

X_432544: 48 ECTS

X_432545: 54 ECTS

X_432546: 60 ECTS

Major Research Project DDS Medicinal Chemistry, DDTF

Vakcode	X_432729 ()
Periode	Ac. Jaar (september)
Credits	24.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M.H. Siderius
Examinator	dr. M.H. Siderius
Niveau	600

Major Research Project DDS Molecular Toxicology, CMCT

Vakcode	X_432730 ()
Periode	Ac. Jaar (september)
Credits	24.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. D.P. Geerke
Examinator	dr. D.P. Geerke

Niveau	600
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Major Research Project DDS Molecular Toxicology, DDSA

Vakcode	X_432559 (432559)
Periode	Ac. Jaar (september)
Credits	42.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J.N.M. Commandeur
Examinator	dr. J.N.M. Commandeur
Niveau	600

Doel vak

To perform research in the area of molecular and biochemical toxicology and to get familiar with experimental approaches used in this field.

To define a hypothesis based on previous observations or publications, and to design, execute and critically interpret the experiments performed to test specific hypotheses.

Inhoud vak

The research project will be carried out in the context in one of the PhD- or postdoc-projects which are carried out in the section Molecular Toxicology.

Generally, the research is focussed on the role of drug metabolising enzymes, such as cytochromes P450, glutathione transferases, sulfotransferases, etc. in the bioactivation and bioinactivation of toxic drugs and other chemicals, identification of genetically determined enzymes, drug-drug interactions, the identification of reactive intermediates and cellular targets of reactive intermediates and cellular responses related to cytotoxicity or adaptation reactions.

Onderwijsvorm

Experimental research project, starting with a brief literature survey on the topic to be investigated.

Toetsvorm

Written report, (participation to) work discussions, and oral presentation in the section of Molecular Toxicology.

Literatuur

Relevant reviews will be provided at the start of the project.

Aanbevolen voorkennis

Courses ADMET, Drug-induced stress and cellular signalling or equivalent courses.

Doelgroep

mDDS-DDSA

Overige informatie

Registration for a research project should be ultimately 4 weeks in advance. General information on projects to which the student can participate will be provided by master coordinator dr JNM Commandeur

(j.n.m.commandeur@vu.nl) and, more specifically, by PhD-students and postdocs of the section Molecular Toxicology.

Major Research Project DDS Molecular Toxicology, DDSA

Vakcode	X_432561 (432561)
Periode	Ac. Jaar (september)
Credits	48.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J.N.M. Commandeur
Examinator	dr. J.N.M. Commandeur
Niveau	600

Doel vak

To perform research in the area of molecular and biochemical toxicology and to get familiar with experimental approaches used in this field.

To define a hypothesis based on previous observations or publications, and to design, execute and critically interpret the experiments performed to test specific hypotheses.

Inhoud vak

The research project will be carried out in the context in one of the PhD- or postdoc-projects which are carried out in the section Molecular Toxicology.

Generally, the research is focussed on the role of drug metabolising enzymes, such as cytochromes P450, glutathione transferases, sulfotransferases, etc. in the bioactivation and bioinactivation of toxic drugs and other chemicals, identification of genetically determined enzymes, drug-drug interactions, the identification of reactive intermediates and cellular targets of reactive intermediates and cellular responses related to cytotoxicity or adaptation reactions.

Onderwijsvorm

Experimental research project, starting with a brief literature survey on the topic to be investigated.

Toetsvorm

Written report, (participation to) work discussions, and oral presentation in the section of Molecular Toxicology.

Literatuur

Relevant reviews will be provided at the start of the project.

Aanbevolen voorkennis

Courses ADMET, Drug-induced stress and cellular signalling or equivalent courses.

Doelgroep

mDDS-DDSA

Overige informatie

Registration for a research project should be ultimately 4 weeks in advance. General information on projects to which the student can participate will be provided by master coordinator dr JNM Commandeur

(j.n.m.commandeur@vu.nl) and, more specifically, by PhD-students and postdocs of the section Molecular Toxicology.

Major Research Project DDS Molecular Toxicology, DDSA

Vakcode	X_432562 (432562)
Periode	Ac. Jaar (september)
Credits	54.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J.N.M. Commandeur
Examinator	dr. J.N.M. Commandeur
Niveau	600

Doel vak

To perform research in the area of molecular and biochemical toxicology and to get familiar with experimental approaches used in this field.

To define a hypothesis based on previous observations or publications, and to design, execute and critically interpret the experiments performed to test specific hypotheses.

Inhoud vak

The research project will be carried out in the context in one of the PhD- or postdoc-projects which are carried out in the section Molecular Toxicology.

Generally, the research is focussed on the role of drug metabolising enzymes, such as cytochromes P450, glutathione transferases, sulfotransferases, etc. in the bioactivation and bioinactivation of toxic drugs and other chemicals, identification of genetically determined enzymes, drug-drug interactions, the identification of reactive intermediates and cellular targets of reactive intermediates and cellular responses related to cytotoxicity or adaptation reactions.

Onderwijsvorm

Experimental research project, starting with a brief literature survey on the topic to be investigated.

Toetsvorm

Written report, (participation to) work discussions, and oral presentation in the section of Molecular Toxicology.

Literatuur

Relevant reviews will be provided at the start of the project.

Aanbevolen voorkennis

Courses ADMET, Drug-induced stress and cellular signalling or equivalent courses.

Doelgroep

mDDS-DDSA

Overige informatie

Registration for a research project should be ultimately 4 weeks in advance. General information on projects to which the student can participate will be provided by master coordinator dr JNM Commandeur

(j.n.m.commandeur@vu.nl) and, more specifically, by PhD-students and postdocs of the section Molecular Toxicology.

Major Research Project DDS Molecular Toxicology, DDSA

Vakcode	X_432563 (432563)
Periode	Ac. Jaar (september)
Credits	60.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J.N.M. Commandeur
Examinator	dr. J.N.M. Commandeur
Niveau	600

Doel vak

To perform research in the area of molecular and biochemical toxicology and to get familiar with experimental approaches used in this field.

To define a hypothesis based on previous observations or publications, and to design, execute and critically interpret the experiments performed to test specific hypotheses.

Inhoud vak

The research project will be carried out in the context in one of the PhD- or postdoc-projects which are carried out in the section Molecular Toxicology.

Generally, the research is focussed on the role of drug metabolising enzymes, such as cytochromes P450, glutathione transferases, sulfotransferases, etc. in the bioactivation and bioinactivation of toxic drugs and other chemicals, identification of genetically determined enzymes, drug-drug interactions, the identification of reactive intermediates and cellular targets of reactive intermediates and cellular responses related to cytotoxicity or adaptation reactions.

Onderwijsvorm

Experimental research project, starting with a brief literature survey on the topic to be investigated.

Toetsvorm

Written report, (participation to) work discussions, and oral presentation in the section of Molecular Toxicology.

Literatuur

Relevant reviews will be provided at the start of the project.

Aanbevolen voorkennis

Courses ADMET, Drug-induced stress and cellular signalling or equivalent courses.

Doelgroep

mDDS-DDSA

Overige informatie

Registration for a research project should be ultimately 4 weeks in advance. General information on projects to which the student can participate will be provided by master coordinator dr JNM Commandeur

(j.n.m.commandeur@vu.nl) and, more specifically, by PhD-students and postdocs of the section Molecular Toxicology

Major Research Project DDS Molecular Toxicology, DDSA (C,E,M)

Vakcode	X_432731 ()
Periode	Ac. Jaar (september)
Credits	24.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J.N.M. Commandeur
Examinator	dr. J.N.M. Commandeur
Niveau	600

Doel vak

To perform research in the area of molecular and biochemical toxicology and to get familiar with experimental approaches used in this field.

To define a hypothesis based on previous observations or publications, and to design, execute and critically interpret the experiments performed to test specific hypotheses.

Inhoud vak

The research project will be carried out in the context in one of the PhD- or postdoc-projects which are carried out in the section Molecular Toxicology.

Generally, the research is focussed on the role of drug metabolising enzymes, such as cytochromes P450, glutathione transferases, sulfotransferases, etc. in the bioactivation and bioinactivation of toxic drugs and other chemicals, identification of genetically determined enzymes, drug-drug interactions, the identification of reactive intermediates and cellular targets of reactive intermediates and cellular responses related to cytotoxicity or adaptation reactions.

Onderwijsvorm

Experimental research project, starting with a brief literature survey on the topic to be investigated.

Toetsvorm

Written report, (participation to) work discussions, and oral presentation in the section of MOlecular Toxicology.

Literatuur

Relevant reviews will be provided at the start of the project.

Aanbevolen voorkennis

Courses ADMET, Drug-induced stress and cellular signalling or equivalent courses,

Doelgroep

mDDS-DDSA

Overige informatie

Registration for a research project should be ultimately 4 weeks in advance. General information on projects to which the student can participate will be provided by master coordinator dr JNM Commandeur

(j.n.m.commandeur@vu.nl) and, more specifically, by PhD-students and postdocs of the section Molecular Toxicology

Major Research Project Med. Chem., Drug Disc. & Target Find.

Vakcode	X_432550 (432550)
Periode	Ac. Jaar (september)
Credits	48.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M.H. Siderius
Examinator	dr. M.H. Siderius
Niveau	600

Major Research Project Med. Chem., Drug Disc. & Target Find.

Vakcode	X_432551 (432551)
Periode	Ac. Jaar (september)
Credits	54.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M.H. Siderius
Examinator	dr. M.H. Siderius
Niveau	600

Major Research Project Med. Chem., Drug Disc. & Target Find.

Vakcode	X_432552 (432552)
Periode	Ac. Jaar (september)
Credits	60.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M.H. Siderius
Examinator	dr. M.H. Siderius
Niveau	600

Major Research Project Med. Chem., Drug Disc. & Target Find.

Vakcode	X_432547 (432547)
Periode	Ac. Jaar (september)
Credits	42.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M.H. Siderius
Examinator	dr. M.H. Siderius

Niveau	600
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Overige informatie

Period: variable

Major Research Project Mol. Tox., Comp. Med. Chem. & Tox.

Vakcode	X_432553 (432553)
Periode	Ac. Jaar (september)
Credits	42.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. D.P. Geerke
Examinator	dr. D.P. Geerke
Niveau	600

Major Research Project Mol. Tox., Comp. Med. Chem. & Tox.

Vakcode	X_432556 (432556)
Periode	Ac. Jaar (september)
Credits	48.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. D.P. Geerke
Examinator	dr. D.P. Geerke
Niveau	600

Major Research Project Mol. Tox., Comp. Med. Chem. & Tox.

Vakcode	X_432557 (432557)
Periode	Ac. Jaar (september)
Credits	54.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. D.P. Geerke
Examinator	dr. D.P. Geerke
Niveau	600

Major Research Project Mol. Tox., Comp. Med. Chem. & Tox.

Vakcode	X_432558 (432558)
Periode	Ac. Jaar (september)
Credits	60.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen

Coördinator	dr. D.P. Geerke
Examinator	dr. D.P. Geerke
Niveau	600

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. B.J. Regeer, dr. J.F.H. Kupper, dr. C.W.M. Dedding, dr. T.J. Schuitmaker-Warnaar, prof. dr. J.E.W. Broerse
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 an 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:

- lectures 22 hours
- work groups 12 hours
- group project 32 hours
- self study (including mini-essays) 88 hours
- 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%)

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, august 2014.

Doelgroep

Compulsory course within the second year of the Master Management, Policy Analysis and Entrepreneurship for the Health and Life Sciences (MPA)

Overige informatie

Guest Lecturers:

- Wouter Mensink (SCP, UvA)
- Harro van Lente (UU)
- Steven Flipse (TU Delft, De Proeffabriek)

and others

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

Mass Spectrometry

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

Niveau	400
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Inhoud vak

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

Overige informatie

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

Minor Research Project Biomol. Drug Analysis

Vakcode	X_432658 (432658)
Periode	Ac. Jaar (september)
Credits	24.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H. Lingeman
Examinator	dr. H. Lingeman
Niveau	500

Doel vak

To acquire knowledge and insight into the role and objective of drug, bio-analytical and clinical development processes in complex samples using LC-MS and bio-assay-MS based approaches.

Inhoud vak

This project aims to provide the student with a theoretical and practical understanding of the issues involved in the design, conduct, analyses and interpretation of complex analytical studies.

Doelgroep

mDDS

Overige informatie

For further information please contact Henk Lingeman.

Minor Research Project Biomol. Drug Analysis

Vakcode	X_432689 (432689)
Periode	Ac. Jaar (september)
Credits	18.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H. Lingeman
Examinator	dr. H. Lingeman
Niveau	500

Doel vak

To acquire knowledge and insight into the role and objective of drug, bio-analytical and clinical development processes in complex samples using LC-MS and bio-assay-MS based approaches.

Inhoud vak

This project aims to provide the student with a theoretical and practical understanding of the issues involved in the design, conduct, analyses and interpretation of complex analytical procedures.

Doelgroep

mDDS

Overige informatie

For further information please contact Henk Lingeman.

Minor Research Project Biomol. Drug Analysis

Vakcode	X_432704 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H. Lingeman
Examinator	dr. H. Lingeman
Niveau	500

Doel vak

To acquire knowledge and insight into the role and objectie of drug, bio-analytical and clinical development processes in complex samples using LC-MS and bio-assay-MS based approaches.

Inhoud vak

This project aims to provide the student with a theoretical and practical understanding of the issues involved in the design, conduct, analyses and interpretation of complex analytical studies.

Doelgroep

mDDS

Overige informatie

For further information please contact Henk Lingeman.

Minor Research Project DDS Medicinal Chemistry, DD&S

Vakcode	X_432692 (432692)
Periode	Ac. Jaar (september)
Credits	18.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M. Wijtmans
Examinator	dr. M. Wijtmans
Niveau	500

Doel vak

To obtain experience in design and/or synthesis techniques and in doing scientific research.

Inhoud vak

Within medicinal chemistry research, computational chemistry and organic synthesis play a major role in designing and preparing small organic ligands as e.g. protein modulators. During the traineeship, a student from another background can actively participate in a medicinal chemistry research project. The focus can be on organic synthesis, or on drug design. Attention will be paid to setting up research experiments, using state-of-the-art experimental techniques, analyzing experimental results and keeping adequate documentation.

Toetsvorm

Presentation, report, practical work.

Literatuur

Will be provided by the supervisor. The first 1-2 weeks of the traineeship will be spent on literature reading.

Vereiste voorkennis

Entry requirements may apply. Contact the coordinator well in advance.

Aanbevolen voorkennis

Thorough knowledge of organic chemistry.

Doelgroep

mDDS, mCh

Intekenprocedure

Please contact the coordinator well in advance.

Minor Research Project DDS Medicinal Chemistry, DD&S

Vakcode	X_432693 (432693)
Periode	Ac. Jaar (september)
Credits	24.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M. Wijtmans
Examinator	dr. M. Wijtmans
Niveau	500

Doel vak

To obtain experience in design and/or synthesis techniques and in doing scientific research.

Inhoud vak

Within medicinal chemistry research, computational chemistry and organic synthesis play a major role in designing and preparing small organic ligands as e.g. protein modulators. During the traineeship, a student from another background can actively participate in a medicinal chemistry research project. The focus can be on organic synthesis, or on drug design. Attention will be paid to setting up research experiments, using state-of-the-art experimental techniques, analyzing

experimental results and keeping adequate documentation.

Toetsvorm

Presentation, report, practical work.

Literatuur

Will be provided by the supervisor. The first 1-2 weeks of the traineeship will be spent on literature reading.

Vereiste voorkennis

Entry requirements may apply. Contact the coordinator well in advance.

Aanbevolen voorkennis

Thorough knowledge of organic chemistry.

Doelgroep

mDDS, mCh

Intekenprocedure

Please contact the coordinator well in advance.

Minor Research Project DDS Medicinal Chemistry, DD&S

Vakcode	X_432705 (432705)
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M. Wijtmans
Examinator	dr. M. Wijtmans
Niveau	500

Doel vak

To obtain experience in design and/or synthesis techniques and in doing scientific research.

Inhoud vak

Within medicinal chemistry research, computational chemistry and organic synthesis play a major role in designing and preparing small organic ligands as e.g. protein modulators. During the traineeship, a student from another background can actively participate in a medicinal chemistry research project. The focus can be on organic synthesis, or on drug design. Attention will be paid to setting up research experiments, using state-of-the-art experimental techniques, analyzing experimental results and keeping adequate documentation.

Toetsvorm

Presentation, report, practical work.

Literatuur

Will be provided by the supervisor. The first 1-2 weeks of the traineeship will be spent on literature reading.

Vereiste voorkennis

Entry requirements may apply. Contact the coordinator well in advance.

Aanbevolen voorkennis

Thorough knowledge of organic chemistry.

Doelgroep

mDDS, mCh

Intekenprocedure

Please contact the coordinator well in advance.

Minor Research Project DDS Molecular Toxicology, CMCT

Vakcode	X_432632 (432632)
Periode	Ac. Jaar (september)
Credits	24.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. D.P. Geerke
Examinator	dr. D.P. Geerke
Niveau	500

Minor Research Project DDS Molecular Toxicology, DDSA

Vakcode	X_432591 (432591)
Periode	Ac. Jaar (september)
Credits	24.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J.N.M. Commandeur
Examinator	dr. J.N.M. Commandeur
Niveau	500

Doel vak

To perform research in the area of molecular and biochemical toxicology and to get familiar with experimental approaches used in this field. To define a hypothesis based on previous observations or publications, and to design, execute and critically interpret the experiments performed to test specific hypotheses.

Inhoud vak

The research project will be carried out in the context in one of the PhD- or postdoc-projects which are carried out in the section Molecular Toxicology.

Generally, the research is focussed on the role of drug metabolising enzymes, such as cytochromes P450, glutathione transferases, sulfotransferases, etc. in the bioactivation and bioinactivation of toxic drugs and other chemicals, identification of genetically determined enzymes, drug-drug interactions, the identification of reactive intermediates and cellular targets of reactive intermediates and cellular responses related to cytotoxicity or adaptation reactions.

Onderwijsvorm

Experimental research project, starting with a brief literature survey on the topic to be investigated.

Toetsvorm

Written report, (participation to) work discussions, and oral presentation in the section of Molecular Toxicology.

Literatuur

Relevant reviews will be provided at the start of the project.

Aanbevolen voorkennis

Courses ADMET, Drug-induced stress and cellular signalling or equivalent courses.

Doelgroep

mDDS-DDTF, mDDS-CMCT, mDDS-DD&S, mDDS-BCCA

Overige informatie

Registration for a research project should be ultimately 4 weeks in advance. General information on projects to which the student can participate will be provided by master coordinator dr JNM Commandeur (j.n.m.commandeur@vu.nl) and, more specifically, by PhD-students and postdocs of the section Molecular Toxicology.

Minor Research Project DDS Molecular Toxicology, DDSA

Vakcode	X_432592 (432592)
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J.N.M. Commandeur
Examinator	dr. J.N.M. Commandeur
Niveau	500

Doel vak

To perform research in the area of molecular and biochemical toxicology and to get familiar with experimental approaches used in this field. To define a hypothesis based on previous observations or publications, and to design, execute and critically interpret the experiments performed to test specific hypotheses.

Inhoud vak

The research project will be carried out in the context in one of the PhD- or postdoc-projects which are carried out in the section Molecular Toxicology.

Generally, the research is focussed on the role of drug metabolising enzymes, such as cytochromes P450, glutathione transferases, sulfotransferases, etc. in the bioactivation and bioinactivation of toxic drugs and other chemicals, identification of genetically determined enzymes, drug-drug interactions, the identification of reactive intermediates and cellular targets of reactive intermediates and cellular responses related to cytotoxicity or adaptation reactions.

Onderwijsvorm

Experimental research project, starting with a brief literature survey on the topic to be investigated.

Toetsvorm

Written report, (participation to) work discussions, and oral presentation in the section of Molecular Toxicology.

Literatuur

Relevant reviews will be provided at the start of the project.

Aanbevolen voorkennis

Courses ADMET, Drug-induced stress and cellular signalling or equivalent courses.

Doelgroep

mDDS-DDTF, mDDS-CMCT, mDDS-DD&S, mDDS-BCCA

Overige informatie

Registration for a research project should be ultimately 4 weeks in advance. General information on projects to which the student can participate will be provided by master coordinator dr JNM Commandeur (j.n.m.commandeur@vu.nl) and, more specifically, by PhD-students and postdocs of the section Molecular Toxicology.

Minor Research Project DDS Molecular Toxicology, DDSA

Vakcode	X_432620 (432620)
Periode	Ac. Jaar (september)
Credits	18.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J.N.M. Commandeur
Examinator	dr. J.N.M. Commandeur
Niveau	500

Doel vak

To perform research in the area of molecular and biochemical toxicology and to get familiar with experimental approaches used in this field. To define a hypothesis based on previous observations or publications, and to design, execute and critically interpret the experiments performed to test specific hypotheses.

Inhoud vak

The research project will be carried out in the context in one of the PhD- or postdoc-projects which are carried out in the section Molecular Toxicology.

Generally, the research is focussed on the role of drug metabolising enzymes, such as cytochromes P450, glutathione transferases, sulfotransferases, etc. in the bioactivation and bioinactivation of toxic drugs and other chemicals, identification of genetically determined enzymes, drug-drug interactions, the identification of reactive intermediates and cellular targets of reactive intermediates and cellular responses related to cytotoxicity or adaptation reactions.

Onderwijsvorm

Experimental research project, starting with a brief literature survey on the topic to be investigated.

Toetsvorm

Written report, (participation to) work discussions, and oral presentation in the section of Molecular Toxicology.

Literatuur

Relevant reviews will be provided at the start of the project.

Aanbevolen voorkennis

Courses ADMET, Drug-induced stress and cellular signalling or equivalent courses.

Doelgroep

mDDS-DDTF, mDDS-CMCT, mDDS-DD&S, mDDS-BCCA

Overige informatie

Registration for a research project should be ultimately 4 weeks in advance. General information on projects to which the student can participate will be provided by master coordinator dr JNM Commandeur (j.n.m.commandeur@vu.nl) and, more specifically, by PhD-students and postdocs of the section Molecular Toxicology.

Minor Research Project DDS, CMCT

Vakcode	X_432507 (432507)
Periode	Ac. Jaar (september)
Credits	18.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. D.P. Geerke
Examinator	dr. D.P. Geerke
Niveau	500

Inhoud vak

Period: Variable

Minor Research Project DDS, CMCT

Vakcode	X_432707 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. D.P. Geerke
Examinator	dr. D.P. Geerke
Niveau	500

Minor Research Project Med. Chem., Drug Disc. & Target Find.

Vakcode	X_432696 (432696)
Periode	Ac. Jaar (september)
Credits	18.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M.H. Siderius
Examinator	dr. M.H. Siderius
Niveau	500

Overige informatie

Period: variable

Minor Research Project Med. Chem., Drug Disc. & Target Find.

Vakcode	X_432706 (432706)
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M.H. Siderius
Examinator	dr. M.H. Siderius
Niveau	500

Minor Research Project Med. Chem., Drug Disc. & Target.Find.

Vakcode	X_432635 (432635)
Periode	Ac. Jaar (september)
Credits	24.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M.H. Siderius
Examinator	dr. M.H. Siderius
Niveau	500

Omics-procedures in molecular clinical Diagnostics

Vakcode	X_432766 ()
Periode	Periode 5
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H. Lingeman
Examinator	dr. H. Lingeman
Docent(en)	dr. H. Lingeman
Lesmethode(n)	Hoorcollege

Niveau	400
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Doel vak

The primary objective of this course is highlighting the various omics-approaches that are used in drug- and biomarker discovery.

Inhoud vak

Omic-approaches involve the comparison of metabolomes, proteomes and genomes between control and test groups to find differences in their profiles. Those differences may be correlated to the disease being studied in clinical biomarker discovery or changes in the metabolic output in toxicology studies. During the course the fundamentals and applications of omic-based techniques will be discussed. The focus will be on the separation (e.g. chromatography, electrophoresis), detection/identification (e.g. MS, NMR, Spectroscopic) and chemometric procedures to unravel complex biological and clinical samples

Onderwijsvorm

Lectures and projects

Literatuur

Hands-outs (electronically available)

Doelgroep

mCH-AS, mDDS, mMNS

Overige informatie

X_432733 vervalt en is vervangen door X_432766

Physical-Organic Chemistry

Vakcode	X_435663 (435663)
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Lesmethode(n)	Hoorcollege, Werkcollege
Niveau	400

Doel vak

Survey of structural features, reaction mechanisms, and physical organic concepts needed in organic chemistry.

Inhoud vak

Advanced organic chemistry course centered around chemical bonding, stereochemical principles, conformational and stereo-electronic effects, isotope effects, reaction mechanisms, nucleophilic substitutions, eliminations, aromaticity, carbocations, carbanions, radicals, pericyclic reactions, and acid-base catalysis. These structural and mechanistic concepts are essential in organic synthesis.

Onderwijsvorm

Lectures and tutorials with homework

Toetsvorm

Written or oral examination and assignments.

Literatuur

Anslyn, E.V., and Duggerty, D.A., Modern Physical Organic Chemistry. University Science Books, 2006.

Vereiste voorkennis

BSc

Aanbevolen voorkennis

BSc S, BSc F

Doelgroep

mCh, mF

Policy, Politics and Participation

Vakcode	AM_470589 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	C.A.C.M. Pittens MSc
Examinator	C.A.C.M. Pittens MSc
Docent(en)	dr. B.J. Regeer, dr. J.F.H. Kupper, prof. dr. J.E.W. Broerse
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	500

Doel vak

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

To acquire further insight into the practice of interactive research;

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

To strengthen the skills to design an interactive research project

To practice skills in data collection and analysis;

To learn to set up valid lines of argumentation;

To improve your communication skills;

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

Inhoud vak

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

Specific attention is paid to your personal interactive research skills.

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

Onderwijsvorm

Total course 6 EC = 160 hours

lectures 14 hours

training workshops 4 hours,

project assignment 102 hours

focus group execution 3 hours

Self study 33 hours

final presentations project results: 4 hours

Toetsvorm

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

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

Literatuur

To be announced on Blackboard

Vereiste voorkennis

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

Doelgroep

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

Intekenprocedure

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

Overige informatie

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

Praktijk I

Vakcode	O_MLPRAKI ()
Periode	Periode 1+2+3, Periode 4+5+6
Credits	15.0
Voertaal	Nederlands
Faculteit	Faculteit der Psychologie en Pedagogiek
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 uren 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	Periode 1+2+3, Periode 4+5+6
Credits	15.0
Voertaal	Nederlands
Faculteit	Faculteit der Psychologie en Pedagogiek
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.

Principles of Pharmaceutical Sciences / Pharmacology

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 farmaceutische wetenschappen and these mDDS students should contact the mDDS coordinator before enrolling.

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

Professionele ontwikkeling en onderzoek I

Vakcode	O_MLVPOOI ()
Periode	Periode 1+2+3, Periode 4+5+6
Credits	3.0
Voertaal	Nederlands
Faculteit	Faculteit der Psychologie en Pedagogiek
Docent(en)	drs. J.K.W. Riksen, drs. H.R. Goudsmit, drs. Y.G. Meindersma, drs. I. Pauw, drs. W.S. Hoekstra, drs. C.D.P. van Oeveren, drs. S. Donszelmann, drs. S. Attema-Noordewier, drs. W. Jongejan, dr. H.B. Westbroek, dr. E. van den Berg, C.L. Geraedts, drs. A. Krijgsman, prof. dr. J.J. Beishuizen, dr. A.A. Kaal, dr. J.J.M. van Eersel, drs. K.L. Schaap, W. Maas, drs. G.D. van Hummel, 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

Voor alle onderdelen geldt een aanwezigheidsplicht.

Professionele ontwikkeling en onderzoek II

Vakcode	O_MLVPOOII ()
Periode	Periode 1+2+3, Periode 4+5+6
Credits	6.0
Voertaal	Nederlands
Faculteit	Faculteit der Psychologie en Pedagogiek
Coördinator	dr. H.B. Westbroek
Examinator	dr. H.B. Westbroek

Docent(en)	dr. C.P. van Velzen, drs. W. Jongejan, dr. T. Bosma, dr. H.B. Westbroek, dr. E. van den Berg, dr. A.A. Kaal, dr. J.J.M. van Eersel, dr. A. Handelzalts, W. Maas
Lesmethode(n)	Hoorcollege, Werkcollege
Niveau	500

Doel vak

De student kan een praktijkonderzoek opzetten, uitvoeren en hierover rapporteren.

Inhoud vak

Dit vak bestaat uit twee delen: een reflectiedeel en een onderzoeksdeel. Het reflectiedeel krijgt vorm en inhoud in begeleide en zelfstandige intervisiegroepen waarin studenten reflecteren op hun praktijk aan de hand van cases en eigen videobeelden. Daarnaast formuleren de studenten in dit deel hun visie op onderwijs en leren.

In het praktijkonderzoeksdeel diept de student in samenwerking met een medestudent één of meer vraagstukken uit de (eigen) onderwijspraktijk uit. Hij of zij doet dat door het samen opzetten, uitvoeren en evalueren van een op de eigen onderwijspraktijk gericht onderzoek waarbij op één of enkele scholen empirisch materiaal wordt verzameld. Aan de hand van de opzet die deels gemaakt is tijdens de module Professionele Ontwikkeling en Onderzoek 1 en deels in POO 2 ontwerpen studenten onderzoeksinstrumenten om empirisch gegevens te verzamelen voor het beantwoorden van de onderzoeksvraag en voeren zij het onderzoek uit.

Voordat het onderzoeksplan mag worden uitgevoerd, moet het worden goedgekeurd door de eerste en tweede beoordelaar.

In een artikel voor collega docenten rapporteren studenten over het onderzoek waarin aan de orde komen vraagstelling, relevantie, verankering in bestaande theorie, gebruikte instrumenten, data, conclusie en discussie. De studenten presenteren ook hun onderzoek tijdens de Onderwijsresearchdag.

Onderwijsvorm

Onderzoek, verplichte deelname aan hoorcolleges praktijkonderzoek en werkcollege, intervisiebijeenkomsten, individuele begeleiding door instituu/begeleiders.

Toetsvorm

De rapportage van het praktijkonderzoek vindt plaats in de vorm van een posterpresentatie en een artikel voor een vaktijdschrift voor leraren.

Het artikel wordt gezamenlijk beoordeeld door de eerste begeleider en tweede lezer, die wordt aangezocht door de eerste begeleider. De presentatie van het onderzoek op de Onderwijsresearchdag wordt meegenomen in de eindbeoordeling. Ook de mate van zelfstandigheid in het opzetten, uitvoeren en rapporteren van het onderzoek wordt beoordeeld

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.

Om dit vak te volgen moet het vak Professionele Ontwikkeling en Onderzoek 1 met goed gevolg zijn afgelegd.

Overige informatie

Voordat het onderzoeksplan mag worden uitgevoerd, moet het worden goedgekeurd door de eerste en tweede beoordelaar.

Voor alle onderdelen geldt een aanwezigheidsplicht.

Project Computational Design and Synthesis of Drugs

Vakcode	X_432734 ()
Periode	Periode 4
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. C. de Graaf
Examinator	dr. C. de Graaf
Docent(en)	dr. M. Wijtmans, dr. C. de Graaf, dr. D.P. Geerke
Lesmethode(n)	Hoorcollege, Practicum
Niveau	400

Doel vak

To gain insight and experience in the molecular modeling tools that enable (rational) drug design and to examine and plan efficient routes to synthesize conceived ligands.

Inhoud vak

In the post-genome era, an overwhelming amount of data describing the molecular characteristics of the targets is becoming available. For example, the structure of many proteins is being determined using X-Ray analysis and NMR techniques. Furthermore, high-throughput screening results in massive amounts of data that reveal the molecular properties of the ligands that are able to have interaction with the drug targets. In this project, several techniques that can help to translate this data into novel ligands will be discussed and applied. Specific topics include crystal structure analysis, the building of homology models, docking of ligands, calculating binding free energy and affinity of ligands for the protein, de novo structure generation, and pharmacophore modeling. These techniques generate ideas for novel compounds. Because a design that cannot be synthesized is by definition a useless design, the synthetic feasibility is a key and integral part of the design process. Therefore, it is important to be able to define a synthetic pathway for the preparation of the designed compounds. In this project, this aspect will be covered by lectures on the concept of retrosynthesis and on the incorporation of some biologically relevant moieties, such as heteroaromatic scaffolds and known affinity-increasers. An online retrosynthetic demonstration with a search engine sets the stage for a case study. For a specific design, a versatile and robust synthesis route has to be defined. A thorough literature search, in combination with detailed study of the reactions involved will result in a report that describes the suggested chemistry in detail.

Onderwijsvorm

Project basis: including lectures, tutorials, self study, assignments and group-work on a case-study.

Toetsvorm

Written examination, preparation of a report.

Vereiste voorkennis

Knowledge of basic organic chemistry.

Doelgroep

mDDS-BCCA, mDDS-CMCT, mDDS-DD&S, mDDS-DDSA, mDDS-DDTF, mDDS-C-var, mDDS-E-var, mDDS-M-var

Protein Analysis

Vakcode	X_435045 (435045)
Periode	Periode 5
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. H. Lingeman
Examinator	dr. H. Lingeman
Docent(en)	dr. H. Lingeman
Lesmethode(n)	Hoorcollege
Niveau	500

Doel vak

Providing a clear overview on the principles and techniques that can be used for the qualitative and quantitative determination of protein-type of compounds.

Inhoud vak

The qualitative and quantitative determination of protein frequently is performed by a combination of chromatographic /electrophoretic and mass spectrometric techniques. The principles of these techniques will be discussed as well as their applications. Special attention will be given to sample treatment procedures and affinity-based separation techniques. With respect to the identification of unknown biological macromolecules, the power of hyphenated techniques in combination with the various modes of mass spectrometry will be highlighted.

Onderwijsvorm

Lectures and tutorials

Toetsvorm

Oral examination.

Literatuur

Hand-outs (electronically available).

Vereiste voorkennis

Basic knowledge of biochemistry, separation sciences, spectroscopy and mass spectrometry.

Qualitative and Quantitative Research Methods

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

Doel vak

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

Inhoud vak

Contemporary societies increasingly face complex social problems, like climate change, HIV/ AIDS or ethnic and religious diversity . These complex problems involve a variety of social actors: policy-makers, professionals, NGOs, industry, science and of course the public at large. Addressing such complex issues demands an approach that investigates, analyzes and integrates the positions and knowledge of different actors. This course offers an (advanced) introduction to various research methods used in real world research: questionnaires, systematic observations using all the senses, surveys and statistics, semi-structured in-depth interviews, as well as focus groups. These methods are commonly used in research into complex problem contexts, communication and opportunities for intervention. Strengths and weaknesses of each research method and technique will be discussed, as well as its possibility to be applied in different societal contexts. Throughout the course, you will apply theoretical knowledge about the various research methodologies in the training of different qualitative and quantitative methods, and in making a research design. In small groups, you are trained in: (1) qualitative research methods such as semi structured interviews and observation techniques, (2) quantitative research methods such as questionnaires, 3) analysis of the data, and (4) writing a research design.

Onderwijsvorm

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

Toetsvorm

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

Literatuur

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

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

Doelgroep

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

Overige informatie

Attendance of training workshops is compulsory. For further information please contact Marlous Arentshorst: m.e.arentshorst@vu.nl

Science and Communication

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

Doel vak

- Gain theoretical insight in the relationship between science and society,
- Gain insight in the role of science communication in this relationship,
- Acquire knowledge of different theories and models of science communication,
- Acquire knowledge of different strategies, media and activities for science communication,
- Learn how to apply theoretical concepts to real-life examples,
- Development of practical skills for science communication (e.g. writing, discussing).

Inhoud vak

Science is all around us and shapes our lives in many different ways. From the vaccines you need for travelling abroad, to the technological devices you use on a daily basis. At the same time, society shapes the

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

Onderwijsvorm

Lectures (22 h)

Workgroups (18 h)

Home-study for group assignments (8 h)

Home-study for individual assignments/exam (90h)

Toetsvorm

Individual assignments (30%), group assignment (10%), examination (60%).

For all parts a pass grade needs to be obtained.

Literatuur

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

Doelgroep

The course Science and Communication is a compulsory course for students of the Master specialisation Science Communication

(Wetenschapscommunicatie) and is a prerequisite for the internship.

Science and Communication is an optional course for students from other master programs in the health and life sciences.

Science in Dialogue

Vakcode	AM_1002 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. J.F.H. Kupper
Examinator	dr. J.F.H. Kupper
Docent(en)	dr. J.F.H. Kupper
Lesmethode(n)	Werkgroep, Hoorcollege
Niveau	500

Doel vak

To gain knowledge of and insight into:

- the basic concepts and issues in the understanding of science-society interactions, both from a philosophical and communication science perspective

- the nature and course of interpersonal and group communication processes relevant to the formal and informal dialogue between science and society
- the nature and form of dialogical science communication, aimed at reflective learning and mutual understanding

To acquire or improve:

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

Inhoud vak

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

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

Every course week is completed with a mini-exam.

Onderwijsvorm

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

Toetsvorm

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

Literatuur

Is announced on blackboard one month before start of the course

Doelgroep

Optional course in the MSc specialization Science Communication

Overige informatie

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

Science Journalism

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

Doel vak

To acquire knowledge of and insight into:

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

To acquire skills in:

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

Orientation to the professional practice of science journalism

Inhoud vak

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

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

Finally, the course trains specific skills that you need as a science journalist, such as popular writing, interviewing, conceptual analysis and program design.

Onderwijsvorm

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

Toetsvorm

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

Literatuur

Announced on Blackboard one month before start of the course

Doelgroep

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

Overige informatie

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

Science Museology

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

Doel vak

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

Inhoud vak

This course is about the role of science museums/centers, zoos and natural history museums in science communication. You will get familiar with theories of science communication in museum settings, and will be introduced to different styles of communication, different approaches to exhibit design & development, and different methods of research and evaluation of exhibitions.

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

Through individual and group assignments you are encouraged to combine theory and practice, working step-by-step towards (part of) an exhibition (re-)design. The group assignments are commissioned by museums and science centers, such as NEMO, Museon, Naturalis, Delft

Science Centre, and Artis.

Onderwijsvorm

Lectures (14 h)

Workgroups (40 h)

Home-study for group assignments (64 h)

Home-study for individual assignments (32 h)

Toetsvorm

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

Literatuur

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

Vereiste voorkennis

Bachelor in any of the Beta Sciences

Doelgroep

Optional course in the C-differentiations (Science Communication) of most of the two-year master programs of the FALW and FEW faculties. Master students from other universities in any scientific field are welcome as well.

Overige informatie

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

Scientific Writing in English

Vakcode	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, Werkcollege
Niveau	400

Doel vak

The aim of this course is to provide the writing student with the essential linguistic means for producing English academic texts which are effective, idiomatically and stylistically appropriate and grammatically correct.

Inhoud vak

The initial focus in the course lies on the form of scientific texts in the Exact Sciences:

- Abstract (or summary)
- Introduction
- Methods
- Results

- Discussion

General course outline

Introducing the topics

- Academic and technical writing in English
- The characteristics of different kinds of scientific texts
- How scientific writing is judged and assessed
- Where do you find your information and how do you present it?
- How to avoid committing plagiarism

Who am I writing for? What do I want to say?

- Your readership
- Key parts of an academic article: title, abstract, introduction, methods, results and discussion

Writing the actual article

- Paragraph and sentence construction: how do I link paragraphs together?
- Writing simple and complex sentences. Active and passive sentences.
- Argumentation : how do I put an argument? How do I frame my own opinion?

Should I use "I" or "we"?

Writing correct English

- Use of apostrophes and colons
- Word order, verb tenses, time and tense
- Avoiding mistakes typically made by Dutch writers
- Common spelling mistakes

You will be making considerable use of peer assessment: examining fellow students' written work and giving them feedback. This method provides useful insights into how a text might be improved. The process of providing someone else with feedback on their text is something that you will find very instructive.

Onderwijsvorm

The course is focused on self-tuition. The plenary sessions concentrate on the process of writing and the product of writing. Homework is part of the course. With each topic, participants work through a phased series of exercises that usually conclude with the requirement to write a short piece of text. The instructor will append extensive written remarks to this text.

Toetsvorm

There will be no examination. However, students will receive their credits only when they have participated in all classes (presence is obligatory) and also when they have handed in the assignments satisfactorily. Students will receive a 'pass' when they have finished the course.

Literatuur

For this course you need the book *Effective Scientific Writing: an advanced learner's guide to better English* (A. Bolt & W. Bruins, ISBN 978 90 8659 6171). This book can be obtained at the VU bookstore, which is located in the VU main building. The costs are € 27,95 per book. For questions contact the Taalcentrum-VU at 020 - 598 9804.

Vereiste voorkennis

Bachelor Exact Sciences

Doelgroep

Optional for mAI, mCS, mIS, mBIO, mPDCS, mCh, mDDS, mPhys.

Signal Transduction in Health and Disease

Vakcode	X_432535 (432535)
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. M.J. Smit
Examinator	prof. dr. M.J. Smit
Docent(en)	dr. M.J. Smit
Lesmethode(n)	Hoorcollege
Niveau	600

Doel vak

At the end of this theoretical course, the students are aware of the latest insights of cellular signal transduction in both healthy and pathological conditions.

Inhoud vak

This course will link human genetic variation (somatic and inherited mutations) to the development of disease and will focus on pathological signaling, mutant signaling proteins in disease and possible treatment of resulting disease (small compounds, biologicals, gene therapy). Modern pharmacological concepts, including constitutive receptor activity, receptor regulation, allosteric modulation and dimerization will be addressed in light of signal transduction in health and disease. A special focus will be on signal transduction resulting in pathologies such as Alzheimer, Parkinson's disease, inflammatory diseases and cancer.

Onderwijsvorm

Lectures, self-study.

Students will do a case study in groups on a receptor/protein family linked to disease. Molecular mechanisms underlying pathology will be addressed and presented.

Toetsvorm

Assignment and presentation, written exam.

Literatuur

Marks e.a., Cellular Signal Processing. Garland Sci (ISBN 0-8153-4215-2).

Papers available on Blackboard

Aanbevolen voorkennis

Bachelor Biology, Medical Biology, Pharmaceutical Sciences, Medical Natural Sciences, Biomolecular Science portal course or equivalent

Doelgroep

mBMS-BC, mDDS-BCCA, mDDS-CMCT, mDDS-DD&S, mDDS-DDSA, mDDS-DDTF, mDDS-C-var, mDDS-E-var, mDDS-M-var, mMNS-MCD, mMNS-MPy

Supramolecular Chemistry and Nanomaterials

Vakcode	X_435653 (435653)
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Lesmethode(n)	Hoorcollege
Niveau	400

Inhoud vak

The course description is available at

<http://studiegids.uva.nl/web/uva/sgs/en/c/211.html>

Doelgroep

mCh-MDSC, mCh-MSP, mDDS-CMCT, mDDS-DDSA, mDDS-DDTF

Overige informatie

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

Synthetic Approaches in Medicinal Chemistry

Vakcode	X_435685 (435685)
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M. Wijtmans
Examinator	dr. M. Wijtmans
Docent(en)	prof. dr. I.J.P. de Esch, dr. M. Wijtmans
Lesmethode(n)	Hoorcollege
Niveau	500

Doel vak

To obtain detailed knowledge of vital organic reactions and synthetic strategies.

Inhoud vak

Within a medicinal chemistry context, organic synthesis continues to play a vital role because it allows perceived organic molecules to actually be prepared. A medicinal chemist with thorough knowledge of the synthetic toolbox will be able to efficiently find his/her way to a target molecule.

First, a brief recap of some synthesis principles is offered. Then, the course will focus on the most important and generally used synthetic reactions. These include reactions of nucleophilic carbon intermediates, nucleophilic substitutions, electrophilic additions to carbon-carbon multiple bonds, reductions, oxidations, cycloadditions, aromatic substitution reactions, rearrangements, and reactions of transition metals as well as of Group I and II metals. Collectively, this course delivers the synthetic knowledge necessary for efficient synthesis of organic molecules. The dynamic character of the synthetic toolbox is

Onderwijsvorm

The "Flipped classroom method" is used.

This means that all lectures have been recorded (slides + audio) and need to be independently studied by the students (there are no regular classes). Rather, all contact hours are used for intensive problem solving sessions.

Toetsvorm

Written examination(s).

Literatuur

Carey, F.A., Sundberg, R.J., Advanced Organic Chemistry, Part B, 5th edition.

Vereiste voorkennis

Basic knowledge of organic chemistry.

Aanbevolen voorkennis

Knowledge of basic organic chemistry.

Doelgroep

mDDS-DD&S

Intekenprocedure

VUNet

Teaching Assistant

Vakcode	X_432741 ()
Periode	Ac. Jaar (september)
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. ir. R.V.A. Orru
Examinator	prof. dr. ir. R.V.A. Orru
Niveau	400

Teaching Assistant

Vakcode	X_432742 ()
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. ir. R.V.A. Orru
Examinator	prof. dr. ir. R.V.A. Orru
Niveau	400

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
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

mCh-AS, mCh-MDSC, mCh-MSP, mCh-SES, mDDS-BCCA, mDDS-CMCT, mDDS-DD&S, mDDS-DDSA, mDDS-DDTF

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 to 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).

Priority is given to MSc students. If any of the 24 seats are left, the course may also be accessible to 3rd year BSc students FAR en SK with a strong interest in educational aspects (first-come, first-serve basis).

Interested BSc students should first contact Maikel Wijtmans (m.wijtmans@vu.nl).

Vakdidactiek Scheikunde I

Vakcode	O_MLVDSKI ()
Periode	Periode 1+2, Periode 4+5
Credits	3.0
Voertaal	Nederlands
Faculteit	Faculteit der Psychologie en Pedagogiek
Coördinator	dr. H.B. Westbroek
Examinator	dr. H.B. Westbroek
Docent(en)	dr. H.B. Westbroek, dr. E. van den Berg, F.L. de Vries MSc
Lesmethode(n)	Werkcollege
Niveau	500

Doel vak

De student maakt kennis met de inhoud en didactiek van het schoolvak en leert deze inzichten in de praktijk vorm te geven.

Inhoud vak

De colleges van vakdidactiek I bieden een inleiding in het schoolvak en de lesmethoden, met aandacht voor lesplan en toetsing. Er is ook aandacht voor vakspecifieke kennis en vaardigheden en de voor het schoolvak relevante ICT-toepassingen. In het vakdidactiekprogramma vindt eveneens een vertaling plaats van algemeen didactische thema's naar het vak. De leservaringen op school spelen hierbij een belangrijke rol.

Onderwijsvorm

Interactieve hoor- en werkcolleges

Toetsvorm

Beoordeling op basis van ingeleverde portfolio-opdrachten

Literatuur

Een syllabus wordt op het eerste college uitgereikt

Vereiste voorkennis

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

Overige informatie

Er geldt een aanwezigheidsplicht

Vakdidactiek Scheikunde II

Vakcode	O_MLVDSKII ()
Periode	Periode 1+2, Periode 4+5
Credits	6.0
Voertaal	Nederlands
Faculteit	Faculteit der Psychologie en Pedagogiek
Coördinator	dr. H.B. Westbroek
Examinator	dr. H.B. Westbroek
Docent(en)	dr. H.B. Westbroek, dr. E. van den Berg, F.L. de Vries MSc
Lesmethode(n)	Werkcollege
Niveau	500

Doel vak

De student kan vakinhoudelijke en vakdidactische kennis, vaardigheden en inzichten vertalen naar de eigen vaklessen.

Inhoud vak

De colleges van vakdidactiek II bieden een voortzetting van de schoolvakspecifieke vakdidactiek. De belangrijkste opdracht is het ontwerp en de uitvoering van een lessenserie van 3 lessen, die inhoudelijk en vakdidactisch verantwoord moet worden.

Onderwijsvorm

Interactieve hoor- en werkcolleges

Toetsvorm

Beoordeling op basis van ingeleverde portfolio-opdrachten

Literatuur

Een syllabus wordt op het eerste college uitgereikt

Vereiste voorkennis

Vakdidactiek I, Algemene didactiek en pedagogiek I, Praktijk I

Overige informatie

Er geldt een aanwezigheidsplicht

Verdieping

Vakcode	O_MLVERD ()
Periode	Periode 2+3, Periode 5+6
Credits	3.0
Voertaal	Nederlands
Faculteit	Faculteit der Psychologie en Pedagogiek
Docent(en)	drs. J.K.W. Riksen, drs. H.R. Goudsmit, drs. Y.G. Meindersma, drs. W.S. Hoekstra, drs. S. Donszelmann, dr. H.B. Westbroek, dr. E. van den Berg, C.L. Geraedts, drs. A. Krijgsman, dr. J.J.M. van Eersel, drs. K.L. Schaap, W. Maas, drs. G.D. van Hummel, F.L. de Vries MSc, drs. H. Stouthart, drs. I. Pauw, drs. C.D.P. van Oeveren
Lesmethode(n)	Werkcollege,
Niveau	500

Doel vak

1. De student verdiept zich in een onderdeel binnen zijn of haar schoolvak of cluster.
2. De student is zich bewust van zijn of haar rol als docent in een pluriforme samenleving.
3. De student kan verschillende aspecten van diversiteit in het onderwijs benoemen en aangeven in hoeverre deze aspecten in zijn of haar eigen schoolvak een rol spelen.

Inhoud vak

Binnen de clusters en vakken worden (verplichte) verdiepingsmodulen aangeboden. Daarnaast volgt elke student het onderdeel diversiteit, waarin een aantal aspecten van onderwijs in een pluriforme samenleving aan bod komen:

1. Wat betekent identiteitsontwikkeling in een door diversiteit gekenmerkte samenleving?
2. Wat is de zin en onzin van diversiteits sensitief onderwijs?
3. Wat zijn de verschillende thematieken van diversiteit in de klas?
4. Wat is er bekend uit onderzoek over diversiteit in de onderwijspraktijk?

Onderwijsvorm

Hoorcollege, werkcollege.

Toetsvorm

Analyse van een casus.

Literatuur

Syllabus met artikelen wordt verstrekt.