Drug Discovery & Safety MSc

Vrije Universiteit Amsterdam - Faculteit der Exacte Wetenschappen - M Drug Discovery and Safety - 2017-2018

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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More information
-All compulsory courses and electives you find in the year schedule;
-A complete description of the programme you find in the Teaching and Examination Regulations;

- For more information about the programma you can contact the academic advisor (VU students only);
- As a VU student you need to register for all courses via VUnet. Only after you completed your enrollment for the study programme you can register for courses;
- More information on all the courses you find through the links below.

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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 EC). This specialization may not be combined with te 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:

- Recommended optional courses. 18 EC
- DDS courses
- Compulsory Courses

Recommended optional courses. 18 EC

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 te 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 EC) of the Communication, education or social variant, the student has to choose 60 EC 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 on the chosen specialization, 6 EC 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
Physical-Organic Chemistry	Periode 1	6.0	X_435663
Project Computational Design and Synthesis of Drugs	Periode 4	6.0	X_432734
Research Skills and Career Perspectives	Ac. Jaar (september)	0.0	XM_0002
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 EC 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	XM_432571
Colloquium and Literature Thesis DDS BDA (C,E,M)	Ac. Jaar (september)	6.0	XM_432570
Colloquium and Literature Thesis DDS MC, DD&S (C,E,M)	Ac. Jaar (september)	6.0	XM_432623
Colloquium and Literature Thesis DDS MC, DDTF (C,E,M)	Ac. Jaar (september)	6.0	XM_432624
Colloquium and Literature Thesis DDS Molecular Toxicology, DDSA (C,E,M)	Ac. Jaar (september)	6.0	XM_432572

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

Students need to select at least 24 credits or more from the following list.

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

Vakken:

Naam	Periode	Credits	Code
Major Research Project DDS Biomolecular Drug Analysis (C,E,M)	Ac. Jaar (september)	24.0	XM_432727
Major Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	24.0	XM_432728
Major Research Project DDS Medicinal Chemistry, DDTF	Ac. Jaar (september)	24.0	XM_432729
Major Research Project DDS Molecular Toxicology, CMCT	Ac. Jaar (september)	24.0	XM_432730
Major Research Project DDS Molecular Toxicology, DDSA (C,E,M)	Ac. Jaar (september)	24.0	XM_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 / Pharmacochemistry	Periode 1	6.0	X_435675

Compulsory Courses

Opleidingsdelen:

- Internship communication

Vakken:

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

Internship communication

Internship commiunication. Choose one.

Vakken:

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

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:

- Master Leraar VHO Scheikunde vanaf 2015
- LVHO Scheikunde, overgangsregeling
- DDS courses

Master Leraar VHO Scheikunde vanaf 2015

Vakken:

Naam	Periode	Credits	Code
Didactiek 1	Periode 1	6.0	O_MLDIDAC_1
Didactiek 2	Periode 2+3	6.0	O_MLDIDAC_2
Didactiek 3	Periode 4+5+6	9.0	O_MLDIDAC_3
Peergroup fase 1	Periode 1+2+3	0.0	O_MLPEERGR_1
Peergroup Fase 2	Periode 3+4+5	0.0	O_MLPEERGR_2
Praktijk 1	Periode 1	6.0	O_MLPRAK_1
Praktijk 2	Periode 2+3	9.0	O_MLPRAK_2
Praktijk 3	Periode 4+5+6	15.0	O_MLPRAK_3
Praktijk 3 voor 2-jarige Master		15.0	O_M2PRAK3
Praktijkonderzoek 1	Periode 3	3.0	O_MLPROZ_1
Praktijkonderzoek 2	Periode 4+5+6	6.0	O_MLPROZ_2

LVHO Scheikunde, overgangsregeling

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 te 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 EC) of the Communication, education or social variant, the student has to choose 60 EC 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 on the chosen specialization, 6 EC 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
Physical-Organic Chemistry	Periode 1	6.0	X_435663
Project Computational Design and Synthesis of Drugs	Periode 4	6.0	X_432734
Research Skills and Career Perspectives	Ac. Jaar (september)	0.0	XM_0002
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 EC 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	XM_432571
Colloquium and Literature Thesis DDS BDA (C,E,M)	Ac. Jaar (september)	6.0	XM_432570
Colloquium and Literature Thesis DDS MC, DD&S (C,E,M)	Ac. Jaar (september)	6.0	XM_432623
Colloquium and Literature Thesis DDS MC, DDTF (C,E,M)	Ac. Jaar (september)	6.0	XM_432624
Colloquium and Literature Thesis DDS Molecular Toxicology, DDSA (C,E,M)	Ac. Jaar (september)	6.0	XM_432572

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

Students need to select at least 24 credits or more from the following list.

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

Vakken:

Naam	Periode	Credits	Code
Major Research Project DDS Biomolecular Drug Analysis (C,E,M)	Ac. Jaar (september)	24.0	XM_432727
Major Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	24.0	XM_432728
Major Research Project DDS Medicinal Chemistry, DDTF	Ac. Jaar (september)	24.0	XM_432729
Major Research Project DDS Molecular Toxicology, CMCT	Ac. Jaar (september)	24.0	XM_432730
Major Research Project DDS Molecular Toxicology, DDSA (C,E,M)	Ac. Jaar (september)	24.0	XM_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 / Pharmacochemistry	Periode 1	6.0	X_435675

Research Variant DDTF

The progamme consists of 120 EC
- compulsory courses 36 credits
- Literature Thesis and Colloquium 12 EC
- compulsory choice Ethics and Portfolio Academic Skills 6 EC
- compulsory choices Major Research Project at least 42 EC
- optional courses to complete 120 EC.

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

In consultation with the master coordinator and depending on the chosen specialization, 6 EC have to be chosen from the following list.

Vakken:

Naam	Periode	Credits	Code
Business Management in Health and Life Sciences	Periode 2	6.0	AM_470584
Caput AIMMS seminars en lezingen	Ac. Jaar (september)	3.0	XM_0001
Clinical Development and Clinical Trials	Periode 3	3.0	AM_1180

Communication, Organization and Management	Periode 2	6.0	AM_470572
Epidemiology	Periode 3	3.0	AM_1179
Ethics and Academic Skills	Ac. Jaar (september)	3.0	XM_432517
Ethics and Academic Skills	Ac. Jaar (september)	6.0	XM_437556
Ethics in Life Sciences	Periode 3	3.0	AM_470707
Managing Science and Technology in Society	Periode 1	6.0	AM_470586
Research methods for analyzing complex problems	Periode 1	6.0	AM_1182
Science and Communication	Periode 1	6.0	AM_470587
Science in Dialogue	Periode 2	6.0	AM_1002
Science Journalism	Periode 2	6.0	AM_471014
Scientific Writing in English	Periode 2, Periode 6	3.0	X_400592
Societal entrepreneurship in health and life sciences	Periode 1	6.0	AM_470575
Teaching Assistant	Ac. Jaar (september)	6.0	XM_432742
Teaching Assistant	Ac. Jaar (september)	3.0	XM_432741
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 / Pharmacochemistry	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	XM_432550

Major Research Project Med. Chem., Drug Disc. & Target Find.	Ac. Jaar (september)	54.0	XM_432551
Major Research Project Med. Chem., Drug Disc. & Target Find.	Ac. Jaar (september)	60.0	XM_432552
Major Research Project Med. Chem., Drug Disc. & Target.Find.	Ac. Jaar (september)	42.0	XM_432547

Recommended optional courses

The subject options of 30, 24, 18 or 12 EC 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	Periode 5	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)	36.0	XM_432836
Company Training Drug Discovery & Target Finding	Ac. Jaar (september)	18.0	XM_432621
Company Training Drug Discovery & Target Finding	Ac. Jaar (september)	24.0	XM_432747
Company Training Drug Discovery & Target Finding	Ac. Jaar (september)	30.0	XM_432752
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	XM_432678
Internship abroad DDS Drug Disc. & Target Find.	Ac. Jaar (september)	24.0	XM_432757
Internship abroad DDS Drug Disc. & Target Find.	Ac. Jaar (september)	30.0	XM_432762
Internship abroad DDS Drug Disc. & Target Find.	Ac. Jaar (september)	36.0	XM_432840

Minor Research Project Biomol. Drug Analysis	Ac. Jaar (september)	24.0	XM_432658
Minor Research Project Biomol. Drug Analysis	Ac. Jaar (september)	30.0	XM_432704
Minor Research Project Biomolecular Drug Analysis	Ac. Jaar (september)	18.0	XM_432689
Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	24.0	XM_432693
Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	18.0	XM_432692
Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	30.0	XM_432705
Minor Research Project DDS Molecular Toxicology, CMCT	Ac. Jaar (september)	24.0	XM_432632
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	24.0	XM_432591
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	30.0	XM_432592
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	18.0	XM_432620
Minor Research Project DDS, CMCT	Ac. Jaar (september)	18.0	XM_432507
Minor Research Project DDS, CMCT	Ac. Jaar (september)	30.0	XM_432707
Minor Research Project Med. Chem., Drug Disc. & Target Find.	Ac. Jaar (september)	18.0	XM_432696
Minor Research Project Med. Chem., Drug Disc. & Target Find.	Ac. Jaar (september)	30.0	XM_432706
Minor Research Project Med. Chem., Drug Disc. & Target.Find.	Ac. Jaar (september)	24.0	XM_432635
Molecular Computational Chemistry	Periode 5	6.0	X_435666
Protein Analysis	Periode 5	6.0	X_435045

Compulsory courses

Vakken:

Naam	Periode	Credits	Code

Colloquium and Literature Thesis DDS MC, DDTF	Ac. Jaar (september)	12.0	XM_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 Skills and Career Perspectives	Ac. Jaar (september)	0.0	XM_0002

Research Variant DDSA

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

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

In consultation with the master coordinator and depending on the chosen specialization, 6 EC have to be chosen from the following list.

Vakken:

Naam	Periode	Credits	Code
Business Management in Health and Life Sciences	Periode 2	6.0	AM_470584
Caput AIMMS seminars en lezingen	Ac. Jaar (september)	3.0	XM_0001
Clinical Development and Clinical Trials	Periode 3	3.0	AM_1180
Communication, Organization and Management	Periode 2	6.0	AM_470572
Epidemiology	Periode 3	3.0	AM_1179
Ethics and Academic Skills	Ac. Jaar (september)	3.0	XM_432517
Ethics and Academic Skills	Ac. Jaar (september)	6.0	XM_437556
Ethics in Life Sciences	Periode 3	3.0	AM_470707
Managing Science and Technology in Society	Periode 1	6.0	AM_470586
Research methods for analyzing complex problems	Periode 1	6.0	AM_1182
Science and Communication	Periode 1	6.0	AM_470587
Science in Dialogue	Periode 2	6.0	AM_1002
Science Journalism	Periode 2	6.0	AM_471014
Scientific Writing in English	Periode 2, Periode 6	3.0	X_400592
Societal entrepreneurship in health and life sciences	Periode 1	6.0	AM_470575
Teaching Assistant	Ac. Jaar (september)	6.0	XM_432742
Teaching Assistant	Ac. Jaar (september)	3.0	XM_432741
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 / Pharmacochemistry	Periode 1	6.0	X_435675

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

Compulsory choice of at least 42 EC.

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	XM_432559
Major Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	48.0	XM_432561
Major Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	54.0	XM_432562
Major Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	60.0	XM_432563

Recommended optional courses

The subject options of 36, 30, 24, or 18 EC 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	Periode 5	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	XM_432672
Company Training DDS Drug, Disp. and Saf. Assessm.	Ac. Jaar (september)	24.0	XM_432746
Company Training DDS Drug, Disp. and Saf. Assessm.	Ac. Jaar (september)	30.0	XM_432751

Company Training DDS Drug, Disp. and Saf. Assessm.	Ac. Jaar (september)	36.0	XM_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	XM_432677
Internship abroad DDS Drug, Disp. and Saf. Assessm.	Ac. Jaar (september)	24.0	XM_432756
Internship abroad DDS Drug, Disp. and Saf. Assessm.	Ac. Jaar (september)	30.0	XM_432761
Internship abroad DDS Drug, Disp. and Saf. Assessm.	Ac. Jaar (september)	36.0	XM_432841
Minor Research Project Biomol. Drug Analysis	Ac. Jaar (september)	24.0	XM_432658
Minor Research Project Biomol. Drug Analysis	Ac. Jaar (september)	30.0	XM_432704
Minor Research Project Biomolecular Drug Analysis	Ac. Jaar (september)	18.0	XM_432689
Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	24.0	XM_432693
Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	18.0	XM_432692
Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	30.0	XM_432705
Minor Research Project DDS Molecular Toxicology, CMCT	Ac. Jaar (september)	24.0	XM_432632
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	24.0	XM_432591
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	30.0	XM_432592
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	18.0	XM_432620
Minor Research Project DDS, CMCT	Ac. Jaar (september)	18.0	XM_432507
Minor Research Project DDS, CMCT	Ac. Jaar (september)	30.0	XM_432707
Minor Research Project Med. Chem., Drug Disc. & Target Find.	Ac. Jaar (september)	18.0	XM_432696

Minor Research Project Med. Chem., Drug Disc. & Target Find.	Ac. Jaar (september)	30.0	XM_432706
Minor Research Project Med. Chem., Drug Disc. & Target.Find.	Ac. Jaar (september)	24.0	XM_432635
Molecular Computational Chemistry	Periode 5	6.0	X_435666
Signal Transduction in Health and Disease	Periode 2	6.0	X_432535

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	XM_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 Skills and Career Perspectives	Ac. Jaar (september)	0.0	XM_0002

Research Variant CMCT

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

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 choice
- Compulsory Courses
- Compulsory courses research master DDS

Ethics and Academic Skills

In consultation with the master coordinator and depending on the chosen specialization, 6 EC have to be chosen from the following list.

Vakken:

Naam	Periode	Credits	Code
Business Management in Health and Life Sciences	Periode 2	6.0	AM_470584
Caput AIMMS seminars en lezingen	Ac. Jaar (september)	3.0	XM_0001
Clinical Development and Clinical Trials	Periode 3	3.0	AM_1180
Communication, Organization and Management	Periode 2	6.0	AM_470572
Epidemiology	Periode 3	3.0	AM_1179
Ethics and Academic Skills	Ac. Jaar (september)	3.0	XM_432517
Ethics and Academic Skills	Ac. Jaar (september)	6.0	XM_437556
Ethics in Life Sciences	Periode 3	3.0	AM_470707
Managing Science and Technology in Society	Periode 1	6.0	AM_470586
Research methods for analyzing complex problems	Periode 1	6.0	AM_1182
Science and Communication	Periode 1	6.0	AM_470587
Science in Dialogue	Periode 2	6.0	AM_1002
Science Journalism	Periode 2	6.0	AM_471014
Scientific Writing in English	Periode 2, Periode 6	3.0	X_400592

Societal entrepreneurship in health and life sciences	Periode 1	6.0	AM_470575
Teaching Assistant	Ac. Jaar (september)	6.0	XM_432742
Teaching Assistant	Ac. Jaar (september)	3.0	XM_432741
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 / Pharmacochemistry	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	XM_432553
Major Research Project Mol. Tox., Comp. Med. Chem. & Tox.	Ac. Jaar (september)	48.0	XM_432556
Major Research Project Mol. Tox., Comp. Med. Chem. & Tox.	Ac. Jaar (september)	54.0	XM_432557
Major Research Project Mol. Tox., Comp. Med. Chem. & Tox.	Ac. Jaar (september)	60.0	XM_432558

Recommended optional choice

The subject options of 30, 24, 18 or 12 EC 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	Periode 5	6.0	X_435612
Company Training Comp. Med. Chem. & Tox.	Ac. Jaar (september)	18.0	XM_432619
Company Training Comp. Med. Chem. & Tox.	Ac. Jaar (september)	24.0	XM_432744
Company Training Comp. Med. Chem. & Tox.	Ac. Jaar (september)	30.0	XM_432749
Density Functional Theory for Chemists	Periode 4	6.0	XM_435111
Drug-induced Stress and Cellular Responses	Periode 2	6.0	X_432536
Internship abroad DDS Comp. Med. Chem. & Tox.	Ac. Jaar (september)	18.0	XM_432675
Internship abroad DDS Comp. Med. Chem. & Tox.	Ac. Jaar (september)	24.0	XM_432754
Internship abroad DDS Comp. Med. Chem. & Tox.	Ac. Jaar (september)	30.0	XM_432759
Internship abroad DDS Comp. Med. Chem. & Tox.	Ac. Jaar (september)	36.0	XM_432838
Minor Research Project Biomol. Drug Analysis	Ac. Jaar (september)	24.0	XM_432658
Minor Research Project Biomol. Drug Analysis	Ac. Jaar (september)	30.0	XM_432704
Minor Research Project Biomolecular Drug Analysis	Ac. Jaar (september)	18.0	XM_432689
Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	24.0	XM_432693
Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	18.0	XM_432692
Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	30.0	XM_432705
Minor Research Project DDS Molecular Toxicology, CMCT	Ac. Jaar (september)	24.0	XM_432632
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	24.0	XM_432591
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	30.0	XM_432592
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	18.0	XM_432620

Minor Research Project DDS, CMCT	Ac. Jaar (september)	18.0	XM_432507
Minor Research Project DDS, CMCT	Ac. Jaar (september)	30.0	XM_432707
Minor Research Project Med. Chem., Drug Disc. & Target Find.	Ac. Jaar (september)	18.0	XM_432696
Minor Research Project Med. Chem., Drug Disc. & Target Find.	Ac. Jaar (september)	30.0	XM_432706
Minor Research Project Med. Chem., Drug Disc. & Target.Find.	Ac. Jaar (september)	24.0	XM_432635
Molecular Computational Chemistry	Periode 5	6.0	X_435666
Signal Transduction in Health and Disease	Periode 2	6.0	X_432535

Compulsory Courses

Vakken:

Naam	Periode	Credits	Code
Biomolecular Simulation in Medicinal Chemistry and Toxicology	Periode 5+6	6.0	X_432664
Colloquium and Literature Thesis DDS MC, CMCT	Ac. Jaar (september)	12.0	XM_432576
Computer-Aided Drug Design and Virtual Screening	Periode 2	6.0	X_432673

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 Skills and Career Perspectives	Ac. Jaar (september)	0.0	XM_0002

Research Variant DD&S

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

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

In consultation with the master coordinator and depending on the chosen specialization, 6 EC have to be chosen from the following list.

Vakken:

Naam	Periode	Credits	Code
Business Management in Health and Life Sciences	Periode 2	6.0	AM_470584
Caput AIMMS seminars en lezingen	Ac. Jaar (september)	3.0	XM_0001
Clinical Development and Clinical Trials	Periode 3	3.0	AM_1180
Communication, Organization and Management	Periode 2	6.0	AM_470572
Epidemiology	Periode 3	3.0	AM_1179
Ethics and Academic Skills	Ac. Jaar (september)	3.0	XM_432517
Ethics and Academic Skills	Ac. Jaar (september)	6.0	XM_437556
Ethics in Life Sciences	Periode 3	3.0	AM_470707
Managing Science and Technology in Society	Periode 1	6.0	AM_470586

Research methods for analyzing complex problems	Periode 1	6.0	AM_1182
Science and Communication	Periode 1	6.0	AM_470587
Science in Dialogue	Periode 2	6.0	AM_1002
Science Journalism	Periode 2	6.0	AM_471014
Scientific Writing in English	Periode 2, Periode 6	3.0	X_400592
Societal entrepreneurship in health and life sciences	Periode 1	6.0	AM_470575
Teaching Assistant	Ac. Jaar (september)	6.0	XM_432742
Teaching Assistant	Ac. Jaar (september)	3.0	XM_432741
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 / Pharmacochemistry	Periode 1	6.0	X_435675

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

Compulsory choice of at least 42 EC.

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	XM_432509
Major Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	48.0	XM_432544
Major Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	54.0	XM_432545
Major Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	60.0	XM_432546

Recommended optional choice

The subject options of 30, 24, 18 or 12 EC 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	XM_432671
Company Training DDS Drug Design & Synth.	Ac. Jaar (september)	24.0	XM_432745
Company Training DDS Drug Design & Synth.	Ac. Jaar (september)	30.0	XM_432750
Company Training DDS Drug Design & Synth.	Ac. Jaar (september)	36.0	XM_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	XM_432676
Internship abroad DDS Drug Design & Synth.	Ac. Jaar (september)	24.0	XM_432755
Internship abroad DDS Drug Design & Synth.	Ac. Jaar (september)	30.0	XM_432760
Internship abroad DDS Drug Design & Synth.	Ac. Jaar (september)	36.0	XM_432839
Minor Research Project Biomol. Drug Analysis	Ac. Jaar (september)	24.0	XM_432658
Minor Research Project Biomol. Drug Analysis	Ac. Jaar (september)	30.0	XM_432704
Minor Research Project Biomolecular Drug Analysis	Ac. Jaar (september)	18.0	XM_432689
Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	24.0	XM_432693
Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	18.0	XM_432692

Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	30.0	XM_432705
Minor Research Project DDS Molecular Toxicology, CMCT	Ac. Jaar (september)	24.0	XM_432632
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	24.0	XM_432591
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	30.0	XM_432592
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	18.0	XM_432620
Minor Research Project DDS, CMCT	Ac. Jaar (september)	18.0	XM_432507
Minor Research Project DDS, CMCT	Ac. Jaar (september)	30.0	XM_432707
Minor Research Project Med. Chem., Drug Disc. & Target Find.	Ac. Jaar (september)	18.0	XM_432696
Minor Research Project Med. Chem., Drug Disc. & Target Find.	Ac. Jaar (september)	30.0	XM_432706
Minor Research Project Med. Chem., Drug Disc. & Target.Find.	Ac. Jaar (september)	24.0	XM_432635
Molecular Computational Chemistry	Periode 5	6.0	X_435666
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	XM_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 Skills and Career Perspectives	Ac. Jaar (september)	0.0	XM_0002

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

In consultation with the master coordinator and depending on the chosen specialization, 6 EC have to be chosen from the following list.

Vakken:

Naam	Periode	Credits	Code
Business Management in Health and Life Sciences	Periode 2	6.0	AM_470584
Caput AIMMS seminars en lezingen	Ac. Jaar (september)	3.0	XM_0001
Clinical Development and Clinical Trials	Periode 3	3.0	AM_1180
Communication, Organization and Management	Periode 2	6.0	AM_470572
Epidemiology	Periode 3	3.0	AM_1179
Ethics and Academic Skills	Ac. Jaar (september)	3.0	XM_432517
Ethics and Academic Skills	Ac. Jaar (september)	6.0	XM_437556
Ethics in Life Sciences	Periode 3	3.0	AM_470707
Managing Science and Technology in Society	Periode 1	6.0	AM_470586
Research methods for analyzing complex problems	Periode 1	6.0	AM_1182
Science and Communication	Periode 1	6.0	AM_470587

Science in Dialogue	Periode 2	6.0	AM_1002
Science Journalism	Periode 2	6.0	AM_471014
Scientific Writing in English	Periode 2, Periode 6	3.0	X_400592
Societal entrepreneurship in health and life sciences	Periode 1	6.0	AM_470575
Teaching Assistant	Ac. Jaar (september)	6.0	XM_432742
Teaching Assistant	Ac. Jaar (september)	3.0	XM_432741
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 / Pharmacochemistry	Periode 1	6.0	X_435675

Choose 1 out of 3

Choice of 1 out of 3 subjects 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
Protein Analysis	Periode 5	6.0	X_435045

Compulsory Choice Research project (Major) including report

Compulsory choice of minimal 42 EC.

Vakken:

Naam	Periode	Credits	Code
Major Research Project Biomol. Drug Analysis	Ac. Jaar (september)	42.0	XM_432564
Major Research Project Biomol. Drug Analysis	Ac. Jaar (september)	48.0	XM_432567
Major Research Project Biomol. Drug Analysis	Ac. Jaar (september)	54.0	XM_432568

Major Research Project Biomol. Drug Analysis	Ac. Jaar (september)	60.0	XM_432569

Elective Space

Students need to select 30, 24, 18 or 12 EC 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	XM_432670
Company Training DDS Biomol. Drug Analysis	Ac. Jaar (september)	24.0	XM_432743
Company Training DDS Biomol. Drug Analysis	Ac. Jaar (september)	30.0	XM_432748
Company Training DDS Biomol. Drug Analysis	Ac. Jaar (september)	36.0	XM_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	XM_432674
Internship abroad DDS Biomol. Drug Analysis	Ac. Jaar (september)	24.0	XM_432753
Internship abroad DDS Biomol. Drug Analysis	Ac. Jaar (september)	30.0	XM_432758
Internship abroad DDS Biomol. Drug Analysis	Ac. Jaar (september)	36.0	XM_432837
Minor Research Project Biomol. Drug Analysis	Ac. Jaar (september)	24.0	XM_432658
Minor Research Project Biomol. Drug Analysis	Ac. Jaar (september)	30.0	XM_432704
Minor Research Project Biomolecular Drug Analysis	Ac. Jaar (september)	18.0	XM_432689
Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	24.0	XM_432693
Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	18.0	XM_432692
Minor Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	30.0	XM_432705

Minor Research Project DDS Molecular Toxicology, CMCT	Ac. Jaar (september)	24.0	XM_432632
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	24.0	XM_432591
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	30.0	XM_432592
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	18.0	XM_432620
Minor Research Project DDS, CMCT	Ac. Jaar (september)	18.0	XM_432507
Minor Research Project DDS, CMCT	Ac. Jaar (september)	30.0	XM_432707
Minor Research Project Med. Chem., Drug Disc. & Target Find.	Ac. Jaar (september)	18.0	XM_432696
Minor Research Project Med. Chem., Drug Disc. & Target Find.	Ac. Jaar (september)	30.0	XM_432706
Minor Research Project Med. Chem., Drug Disc. & Target.Find.	Ac. Jaar (september)	24.0	XM_432635
Molecular Computational Chemistry	Periode 5	6.0	X_435666
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	XM_432577

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 Skills and Career Perspectives	Ac. Jaar (september)	0.0	XM_0002

Double Degree

Opleidingsdelen:

- Ethics and Academic Skills
- Deficiency Courses
- Elective Space
- Choice Thesis 1 out of 5
- Compulsory Courses

Ethics and Academic Skills

In consultation with the master coordinator and depending on the chosen specialization, 6 EC have to be chosen from the following list.

Vakken:

Naam	Periode	Credits	Code
Business Management in Health and Life Sciences	Periode 2	6.0	AM_470584
Caput AIMMS seminars en lezingen	Ac. Jaar (september)	3.0	XM_0001
Clinical Development and Clinical Trials	Periode 3	3.0	AM_1180
Communication, Organization and Management	Periode 2	6.0	AM_470572
Epidemiology	Periode 3	3.0	AM_1179
Ethics and Academic Skills	Ac. Jaar (september)	3.0	XM_432517
Ethics and Academic Skills	Ac. Jaar (september)	6.0	XM_437556
Ethics in Life Sciences	Periode 3	3.0	AM_470707
Managing Science and Technology in Society	Periode 1	6.0	AM_470586
Research methods for analyzing complex problems	Periode 1	6.0	AM_1182
Science and Communication	Periode 1	6.0	AM_470587
Science in Dialogue	Periode 2	6.0	AM_1002
Science Journalism	Periode 2	6.0	AM_471014
Scientific Writing in English	Periode 2, Periode 6	3.0	X_400592

Societal entrepreneurship in health and life sciences	Periode 1	6.0	AM_470575
Teaching Assistant	Ac. Jaar (september)	6.0	XM_432742
Teaching Assistant	Ac. Jaar (september)	3.0	XM_432741
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 / Pharmacochemistry	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 Biomolecular Drug Analysis	Ac. Jaar (september)	18.0	XM_432689
Minor Research Project DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	18.0	XM_432620
Minor Research Project DDS, CMCT	Ac. Jaar (september)	18.0	XM_432507
Minor Research Project Med. Chem., Drug Disc. & Target Find.	Ac. Jaar (september)	18.0	XM_432696
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 5

Vakken:

Naam	Periode	Credits	Code
Colloquium and Literature Thesis DDS MC, CMCT	Ac. Jaar (september)	12.0	XM_432576
Colloquium and Literature Thesis DDS MC, DDTF	Ac. Jaar (september)	12.0	XM_432574
Literature thesis and Colloquium	Ac. Jaar (september)	12.0	XM_432577
Literature thesis and Colloquium DDS Medical Chemistry, DD&S	Ac. Jaar (september)	12.0	XM_432573
Literature thesis and Colloquium DDS Molecular Toxicology, DDSA	Ac. Jaar (september)	12.0	XM_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

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 EC) of the Communication, education or social variant, the student has to choose 60 EC 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 te 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 EC) of the Communication, education or social variant, the student has to choose 60 EC 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 on the chosen specialization, 6 EC 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
Physical-Organic Chemistry	Periode 1	6.0	X_435663
Project Computational Design and Synthesis of Drugs	Periode 4	6.0	X_432734

Research Skills and Career Perspectives	Ac. Jaar (september)	0.0	XM_0002
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 EC 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	XM_432571
Colloquium and Literature Thesis DDS BDA (C,E,M)	Ac. Jaar (september)	6.0	XM_432570
Colloquium and Literature Thesis DDS MC, DD&S (C,E,M)	Ac. Jaar (september)	6.0	XM_432623
Colloquium and Literature Thesis DDS MC, DDTF (C,E,M)	Ac. Jaar (september)	6.0	XM_432624
Colloquium and Literature Thesis DDS Molecular Toxicology, DDSA (C,E,M)	Ac. Jaar (september)	6.0	XM_432572

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

Students need to select at least 24 credits or more from the following list.

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

Vakken:

Naam	Periode	Credits	Code
Major Research Project DDS Biomolecular Drug Analysis (C,E,M)	Ac. Jaar (september)	24.0	XM_432727
Major Research Project DDS Medicinal Chemistry, DD&S	Ac. Jaar (september)	24.0	XM_432728

Major Research Project DDS Medicinal Chemistry, DDTF	Ac. Jaar (september)	24.0	XM_432729
Major Research Project DDS Molecular Toxicology, CMCT	Ac. Jaar (september)	24.0	XM_432730
Major Research Project DDS Molecular Toxicology, DDSA (C,E,M)	Ac. Jaar (september)	24.0	XM_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 / Pharmacochemistry	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	3.0	AM_1180
Epidemiology	Periode 3	3.0	AM_1179
Policy, Politics and Participation	Periode 2	6.0	AM_470589
Societal entrepreneurship in health and life sciences	Periode 1	6.0	AM_470575

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
Research methods for analyzing complex problems	Periode 1	6.0	AM_1182

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. H. Lingeman, 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 and transporters in pharmacokinetics: metabolic
stability, drug-drug interactions, active metabolites, genetic polymorphisms
• 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.

Additional course material will be provided via Canvas

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

Intekenprocedure
Registration via VU-Net.

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
Coördinator	dr. P. Jennings BSc
Examinator	dr. P. Jennings BSc
Lesmethode(n)	Werkcollege
Niveau	500

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

Inhoud vak
The course will deal with principles involved in chemical-induced toxicity including absorption, distribution, metabolism and elimination. This will include:

- Molecular mechanisms of toxicity, including oxidative injury, DNA damage, Endoplasmic Reticulum Stress and receptor binding.
- Organ specific toxicities and developmental toxicity.
- Specific chemical toxicities including, heavy metal toxicity, mutagens, and endocrine disruptors.
- Methodologies to assess chemical hazard, including in vitro techniques, toxicity assays, transcriptomics and bioinformatic approaches.
- Current developments in risk assessment approaches such as Adverse Outcome Pathways.

Onderwijsvorm
Assignments, paper discussions, data analysis, case studies

Toetsvorm
Continuous assessment.

Literatuur
Bal-Price and Jennings. In Vitro Toxicology Systems. Editors: (Eds.) Springer (ISBN 978-1-4939-0521-8).
Casarett, and Doull, Toxicology: The Basic Science of Poisons 8th ed. New York: Pergamon Press (ISBN 987-0-07-176925-9).

Vereiste voorkennis
Courses 'ADMET' and 'Drug-induced stress and Cellular Responses', or equivalent courses are highly desirable.

Doelgroep
mDDS-DDSA, mDDS-DDTF

Analysis of Governmental Policy

Vakcode	AM_470571 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. O.E. Popa
Examinator	dr. O.E. Popa
Docent(en)	J.W. Schuijer, drs. ir. A. Fraaije, A.E. Bunders MSc, drs. ir. F. Vogels
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 create skills for the analysis of complex societal questions or dilemmas;
- To learn to integrate scientific expertise with laypersons' experience;
- To practice data collection and analysis;
- To learn to set up valid lines of argumentation from data to policy recommendations;
- To experience writing a policy advisory report;
- To improve communication skills during a group project;
- To improve 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 psychologal side as from the more social structures and their influence on a deliberative democracy.
The course contains several lectures on theoretical concepts and models

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

Onderwijsvorm
Analysis of Governmental Policy is a parttime course of eight weeks (6 ECTS). Tuition methods include lectures, training workshops, and self-study. Attendance to lectures and project meetings is compusory. In our experience,
relying on self-study alone is insufficient to pass the exam.

Toetsvorm
Written multiple-choice exam (30%)
Personal performance in group meetings (20%)
Group products (50%): report (25%), presentation (25%)
All have to be passed successfully for the student to pass the course

Literatuur
Buse, K., Mays, N., & Walt, G. (2012). Making health policy. McGraw-Hill Education (UK).

Aanbevolen voorkennis
The project integrates the research design made and lessons learned from the first compulsory MPA course: Research Methods for Analyzing Complex Problems

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

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

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

Applied Theoretical Chemistry

Vakcode	X_435612 (435612)
Periode	Periode 5
Credits	6.0

Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. C. Fonseca Guerra
Examinator	dr. C. Fonseca Guerra
Docent(en)	prof. dr. F.M. Bickelhaupt, dr. C. Fonseca Guerra
Lesmethode(n)	Hoorcollege, Onderwijs, Computerpracticum
Niveau	500

Inhoud vak
http://studiegids.uva.nl/xmlpages/page/2017-2018/zoek-vak/vak/31934

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

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 an 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
mCH-AS, mDDS, mMNS

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. 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 intereactions: 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 Canvas.

Vereiste voorkennis
Course "Computational Design and Synthesis of Drugs"

Aanbevolen voorkennis
Course "Computational Design and Synthesis of Drugs"

Doelgroep
mDDS

Overige informatie
Please contact the coordinator two weeks prior to the start of the course (e-mail: d.p.geerke@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	drs. A.M.G. Neevel
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
1. To acquire knowledge and understanding into theory of knowledge valorisation in health and life sciences
2. To acquire knowledge and insight in how to organise, protect and finance a business in health and life sciences
3. To acquire knowledge and understanding into the pharmaceutical industry's business model and business processes
4. To acquire knowledge and understanding into the challenges that face the pharmaceutical industry
5. To apply newly acquired knowledge and understanding by solving case examples
6. To apply newly acquired knowledge and understanding in writing a business plan
7. To reflect on and critically evaluate the role of the pharmaceutical industry in the healthcare system
8. To learn to autonomously write a business plan

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

During the course, prof.dr. Eric Claassen (http://www.falw.vu.nl/en/research/athena-institute/staff/claassen.asp) together with highly experienced guest lecturers from the field will teach theoretical and practical knowledge during lectures and seminars. Tangible subjects that will be discussed during the lectures and seminars include the pharmaceutical industry's business model and business processes, intellectual property, portfolio management, finance, risk capital, grants and subsidies, team building and people management, different legal entities, fiscal and legal aspects when starting a new company, SWOT analysis in the life sciences and clinical trials.

The newly acquired knowledge is tested via an assignment (during which students will write either a personal career business plan or a 'real' business plan) (40% of the total grade), a written exam (40% of the total grade), and a computer seminars (20% of the final grade).

Onderwijsvorm
Lectures: +-50 h
Computer seminars: 7,5 h
Work on assignment and self-study: +- 40h

Toetsvorm
Written exam: 40%
Personal Business Plan: 40%
Computer seminar: 20%
All parts have to be passed successfully.

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

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

Overige informatie
Guest lecturers, companies/organisations:
• Robert Al, TU Eindhoven
• Bart van Wezenbeek, Vereenigde
• Bart Bergstein, Forbion Capital partners
• Michael Mellink & Majorie Soeter, Odgers Berndtson
• Marga Janse, Innovatief LerenLeren BV
• Yp Kroon & Peter van Dongen, NL Octrooicenrtum
• Jeroen Dekker & Rosalie Witjas-Paalberends, Price Waterhouse Coopers
• Arjan Bisseling, AsjesBisseling Belastingadviseurs
• Henk Viëtor, FFund

Caput AIMMS seminars en lezingen

Vakcode	XM_0001 ()
Periode	Ac. Jaar (september)
Credits	3.0

Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. J.E. van Muijlwijk-Koezen
Niveau	500

Doel vak
To become familiar with different topics in the broad field of fundamental research in human life sciences

Inhoud vak
The Amsterdam Institute for Molecules, Medicines and Systems (AIMMS) organizes biweekly the so-called AIMMS-seminars. Next to this, (inter)national researchers are invited for AIMMS Lectures.
The student will visit 6 seminars or lectures, summarize, and reflect on each of them in a written report. The size of the report will be approximately 1 A4 per seminar/lecture.

Toetsvorm
written reports

Intekenprocedure
Please contact the coordinator in advance.

Chemical Biology

Vakcode	X_432538 (432538)
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. J.E. van Muijlwijk-Koezen
Examinator	prof. dr. J.E. van Muijlwijk-Koezen
Docent(en)	dr. M.H. Siderius, prof. dr. R. Leurs, dr. J. Kool, prof. dr. J.E. van Muijlwijk-Koezen
Lesmethode(n)	Hoorcollege, Computerpracticum
Niveau	400

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

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

Onderwijsvorm
lectures, tutorial, consultancy sessions and case study/presentation

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

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

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

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

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

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

Intekenprocedure
Please register as soon as possible online.

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

Clinical Development and Clinical Trials

Vakcode	AM_1180 ()
Periode	Periode 3
Credits	3.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	drs. A.M.G. Neevel
Examinator	prof. dr. H.J.H.M. Claassen
Docent(en)	prof. dr. H.J.H.M. Claassen
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	500

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

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

The Clinical Development & Clinical Trials course will elaborate on the function, design and conduct of clinical trials, as well as the relevant stakeholders involved. The course consists of a theoretical part and an important practical part (e.g. gaining knowledge on clinical trial regulations). Classes include for example: ‘Life Cycle of a Clinical Trial’, ‘Clinical Trial Methodology’, ‘ICH-GCP Principles’, ‘The Ethics Committee’, ‘Safety Considerations in Clinical Trials’, ‘Quality Control & Quality Assurance’, ‘Compliance, Misconduct & Fraud’.

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

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

Toetsvorm
Written exam: 100%

Literatuur
Ray, S., Fitzpatrick, S., Golubic, R. & Fisher, S. (2016). Oxford Handbook of Clinical and Healthcare Research. Oxford University Press, Oxford, UK.
(Additional reading will be provided via Canvas and will serve as background reading for the lectures).

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

Overige informatie
Guest lecturers, organisations/companies:
• Eric Klaver, FourPlus Clinical

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

Vakcode	XM_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	XM_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, CMCT

Vakcode	XM_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.

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

Vakcode	XM_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.

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

Finalizing a literature thesis during summer break months is not possible.

Colloquium and Literature Thesis DDS MC, DDTF

Vakcode	XM_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

Intekenprocedure
For this part of the Masterprogramma, no central registration is required. This will be arranged via the Mastercoordinator / Internship coordinator.

Overige informatie
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	XM_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

Intekenprocedure
For this part of the Masterprogramma, no central registration is required. This will be arranged via the Mastercoordinator / Internship coordinator.

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	XM_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

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

Doelgroep
Master students Drug Discovery and Safety

Intekenprocedure
Contact dr. JNM Commandeur (j.n.m.commandeur@vu.nl) one month before the start of the literature study.

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).

Lecturers:
dr. J.N.M. Commandeur

dr. J.C. Vos
prof.dr. P. Jennings

Communication, Organization and Management

Vakcode	AM_470572 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. E. Muniz Pereira Urias
Examinator	dr. E. Muniz Pereira Urias
Docent(en)	dr. E. Muniz Pereira Urias
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 lecturers on aspects as motivation, managing interpersonal behaviour, leadership, communication and developing and changing organisations. The speakers explain theories from literature and relate them to their practical experiences. Also, practical cases of health care companies will be analysed and discussed, resulting in advisory reports for management. With the other students you discuss your experiences and a coach helps you relate the experiences to theory.

Onderwijsvorm
Lectures: approximately 22 hours
Response lectures: 4 hours
Training workshops 16 hours
Self-study and writing project assignment: remaining hours.

Toetsvorm
Written exam (60%;) and assignment (40%). Grades of both parts must at least be 6 or higher.

Literatuur
To be announced on Canvas

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

Overige informatie
Attendance to training/discussions is indispensable

Lecturers:
dr. E.M.P Urias
guest lectures will be announced on Canvas

Company Training Comp. Med. Chem. & Tox.

Vakcode	XM_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	XM_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	XM_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 DDS Biomol. Drug Analysis

Vakcode	XM_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 Jeroen Kool

Company Training DDS Biomol. Drug Analysis

Vakcode	XM_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	XM_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 trails of health interventions.

Doelgroep
mDDS

Overige informatie
For further information please contact Henk Lingeman

Company Training DDS Biomol. Drug Analysis

Vakcode	XM_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	XM_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, DD&S

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	XM_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, DD&S

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	XM_432750 ()
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 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, DD&S

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	XM_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, DD&S

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	XM_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.

Vereiste voorkennis
Courses ADMET, Drug-induced stress and cellular signalling,
Approval by the master coordinator and Exam committee of the master DDS.

Doelgroep

Master students Drug Discovery and Safety, track Drug Disposition and Safety Assessment

Intekenprocedure
Contact mastercoordinator dr JNM Commandeur (j.n.m.commandeur@vu.nl).

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
.

|Lecturers:
dr. J.N.M. Commandeur
dr. J.C. Vos

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

Vakcode	XM_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
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.

Vereiste voorkennis
Courses ADMET, Drug-induced stress and cellular signalling,
Approval by the master coordinator and Exam committee of the master DDS.

Doelgroep
Master students Drug Discovery and Safety, track Drug Disposition and Safety Assessment

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
.

Lecturers:
dr. J.N.M. Commandeur
dr. J.C. Vos

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

Vakcode	XM_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.

Vereiste voorkennis
Courses ADMET, Drug-induced stress and cellular signaling.

Doelgroep
Master students Drug Discovery and Safety, track Drug Disposition and Safety Assessment

Intekenprocedure
Contact mastercoordinator dr JNM Commandeur (j.n.m.commandeur@vu.nl).

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
.

Lecturers:
dr. J.N.M. Commandeur
dr. J.C. Vos

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

Vakcode	XM_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.

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

Doelgroep
Master students Drug Discovery and Safety, track Drug Disposition and Safety Assessment

Intekenprocedure
Contact mastercoordinator dr JNM Commandeur (j.n.m.commandeur@vu.nl).

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
.

Lecturers:
dr. J.N.M. Commandeur
dr. J.C. Vos

Company Training Drug Discovery & Target Finding

Vakcode	XM_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

Intekenprocedure
Voor deze onderdelen van de Master is geen centrale intekening nodig.
Deze onderdelen worden via Mastercoördinator/Stagecoördinator geregeld.

Company Training Drug Discovery & Target Finding

Vakcode	XM_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	XM_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

Intekenprocedure
For this part of the Masterprogramma, no central registration is required. This will be arranged via the Mastercoordinator / Internship coordinator.

Overige informatie
Please contact the coordinator well in advance.

Company Training Drug Discovery & Target Finding

Vakcode	XM_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

Intekenprocedure
For this part of the Masterprogramma, no central registration is required. This will be arranged via the Mastercoordinator / Internship coordinator.

Overige informatie
Please contact the coordinator well in advance.

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	prof. dr. I.J.P. de Esch
Examinator	prof. dr. I.J.P. de Esch
Docent(en)	prof. dr. I.J.P. de Esch, 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 wil learn how in silico methods can be complemented with experimental studies in concrete ligand discovery and design projects.

Onderwijsvorm
Lectures, case study sessions, and self-study.

Toetsvorm
Written (or oral) examination (60%) and case study (report: 20%, presentation: 15%; participation in case study sessions: 5%)

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 Canvas.

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	XM_435111 (435111)
Periode	Periode 4
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. C. Fonseca Guerra
Examinator	dr. C. Fonseca Guerra
Docent(en)	prof. dr. F.M. Bickelhaupt

Lesmethode(n)	Hoorcollege
Niveau	500

Inhoud vak
http://studiegids.uva.nl/xmlpages/page/2017-2018/zoek-vak/vak/33193

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

Didactiek 1

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

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

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

Inhoud vak
De cursus is geordend rondom zogeheten kernpraktijken die fundamenteel zijn voor het beroep van docent. Bij Didactiek 1 staan de volgende kernpraktijken centraal: (1) contact maken, (2) de les starten, (3) krediet
opbouwen en uitgeven, (4) de les voorbereiden, (5) sturen en corrigeren en (6) volledige instructie geven en de les afsluiten. De reikwijdte van het

didactisch denken en handelen is in deze eerste fase meestal nog beperkt tot één les. De genoemde kernpraktijken komen expliciet aan de orde bij AD. Bij VD wordt aangesloten bij deze kernpraktijken en wordt de vertaalslag gemaakt naar het eigen (school)vak. Daarnaast worden bij VD belangrijke vakdidactische concepten en werkwijzen geïntroduceerd

Bij PG staat de eigen onderwijspraktijk van de docent-in-opleiding (dio) centraal. Concrete vragen en situaties uit de praktijk vormen aanleiding tot analyse en reflectie. Waar bij AD en VD de nadruk ligt op de rollen van de uitvoerende en ontwerpende docent en pedagoog, wordt bij PG nadrukkelijk vorm gegeven aan de rol van onderzoekende professional.

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

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

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

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

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

docentperspectieven zijn geformuleerd voor fase I.

Literatuur
Bij deze cursus worden de volgende algemeen didactische handboeken gebruikt:
- Ebbens, S. & Ettekoven, S. (2016). Effectief leren – basisboek. Groningen: Noordhoff Uitgevers B.V.
- Korthagen, F. & Lagerwerf, B. (2014). Een leraar van klasse. Den Haag: Boom Lemma Uitgevers
- Teitler, P. (2013). Lessen in orde. Bussum: Coutinho.
- Kohnstamm, R. (2009). Kleine ontwikkelingspsychologie: III de puberjaren. Houten: Bohn Stafleu van Loghum.

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

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

Didactiek 2

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

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

Aan het eind van de cursus heeft de student de nodige algemeen didactische en vakdidactische bagage aan te reiken die nodig is voor het handelen als docent waarbij op basis van bestaande lesmaterialen wordt gewerkt.

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

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

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

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

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

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

Tenslotte zijn er, verspreid over de periode, drie PG bijeenkomsten, waarbij dio’s van verschillende vakken in kleine groepen en onder begeleiding de eigen onderwijspraktijk onder de loep nemen en eventuele concerns daarbij bespreken.
Bij alle onderdelen (AD, VD en PG) wordt een actieve houding van de student gevraagd, zowel tijdens de bijeenkomsten daarbuiten. Regelmatig worden er verwerkingsopdrachten gegeven, waar individueel of in groepsverband aan wordt gewerkt. Deze opdrachten worden formatief geëvalueerd, onder andere door middel van (peer)feedback.

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

Literatuur
Bij deze cursus worden de volgende algemeen didactische handboeken gebruikt:
- Ebbens, S. & Ettekoven, S. (2016). Effectief leren – basisboek. Groningen: Noordhoff Uitgevers B.V.
- Korthagen, F. & Lagerwerf, B. (2014). Een leraar van klasse. Den Haag: Boom Lemma Uitgevers
- Teitler, P. (2013). Lessen in orde. Bussum: Coutinho.
- Kohnstamm, R. (2009). Kleine ontwikkelingspsychologie: III de puberjaren. Houten: Bohn Stafleu van Loghum.

Oudere edities van bovenstaande boeken zijn over het algemeen goed bruikbaar.

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

Overige informatie
Beheersing van de inhoud van het desbetreffende schoolvak wordt als voorkennis verondersteld.
Voorwaardelijk voor afronding van Didactiek 2: een voldoende beoordeling van Didactiek 1.

Didactiek 3

Vakcode	O_MLDIDAC_3 ()
Periode	Periode 4+5+6
Credits	9.0
Voertaal	Nederlands
Faculteit	Fac. der Gedrags- en Bewegingswetensch.
Coördinator	dr. B. de Vries
Examinator	dr. B. de Vries

Docent(en)	drs. J.K.W. Riksen, drs. H.R. Goudsmit, drs. Y.G. Meindersma, ir. E.J.F. Scheringa, drs. I. Pauw, drs. C.D.P. van Oeveren, drs. S. Donszelmann, drs. B. Klein, drs. W. Jongejan, dr. H.B. Westbroek, C.L. Geraedts, dr. A.A. Kaal, dr. A. Handelzalts, dr. B. de Vries, drs. A.J.C. Monquil, drs. J.B. Penninx, drs. L.A. van der Bruggen, W. Maas, drs. H. Stouthart, drs. N.H. Ypenburg, drs. E.D. van Noort, drs. J. Quartel MA
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	400

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

Aan het eind van de cursus heeft de student de verdiepende pedagogische, didactische en vakdidactische bagage die nodig is voor het handelen als docent in complexe situaties. Hierbij wordt nadrukkelijk aangesloten bij de ontwikkelingsfase waarin de docent-in-opleiding (dio) zich bevindt (zie inhoud).

Inhoud vak
Het eerste blok van de cursus Didactiek 3 is weer geordend rondom een aantal voor het beroep van docent fundamentele kernpraktijken, namelijk: (1) differentiëren, (2) toetsen, (3) gedrags- en leerproblemen herkennen, (4) omgaan met gedrags- en leerproblemen, (5) mentor zijn en (6) een plek in de schoolorganisatie innemen.
De cursussen Didactiek 1 en 2 vormen samen het basisdeel van de Universitaire Lerarenopleiding (ULO); de cursus Didactiek 3 moet gezien worden als het verdiepingsdeel. In Didactiek 3 komen meer complexe thema’s en kernpraktijken aan de orde. Het (vak)didactisch denken en handelen strekt zich nu ook uit over de lange termijn: er is bijvoorbeeld uitgebreid aandacht voor het vorm geven aan leerlijnen en het omgaan met gedrags- en leerproblemen. Ook wordt de dio nadrukkelijker uitgedaagd om een eigen visie op onderwijs vorm te geven en uit te dragen. Zo is de lesmethode niet langer leidend, maar wordt van dio’s in toenemende mate verwacht zelf invulling te geven aan de inhoud en didactiek van de lessen (waarbij natuurlijk zowel bestaand als eigen materiaal kan worden gebruikt). Tenslotte zullen de (vak) didactische overwegingen die ten grondslag liggen aan de eigen visie onderbouwd moeten worden met behulp van relevante literatuur en eigen praktijkervaringen.

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

Onderwijsvorm
Alle onderwijs vindt plaats op de instituutsdag (maandag). Studenten zijn de hele dag aanwezig. In de ochtend is er een hoor/werkcollege AD, waarbij dio’s van verschillende vakken samen zitten. De colleges AD

worden steeds verzorgd door een tweetal docenten. In de middag is er een werkcollege VD onder begeleiding van de vakdidacticus. Deze colleges worden samen met dio's van hetzelfde vak in verschillende samenstellingen (homogeen en heterogeen) gevolgd .

Tenslotte zijn er, verspreid over de periode, drie PG bijeenkomsten, waarbij dio's van verschillende vakken in kleine groepen en onder begeleiding de eigen onderwijspraktijk onder de loep nemen en eventuele concerns daarbij bespreken.
Bij alle onderdelen (AD, VD en PG) wordt een actieve houding van de student gevraagd, zowel tijdens de bijeenkomsten daarbuiten. Regelmatig worden er verwerkingsopdrachten gegeven, waar individueel of in groepsverband aan wordt gewerkt. Deze opdrachten worden formatief geëvalueerd, onder andere door middel van (peer)feedback.

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

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

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

Overige informatie
Beheersing van de inhoud van het desbetreffende schoolvak wordt als voorkennis verondersteld.
Voorwaardelijk voor afronding van Didactiek 3: een voldoende beoordeling van Didactiek 2.

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. Important cellular and animal model systems used to investigate (pathological and pharmacological) aspects of cell biology in relation to drug discovery will be discussed.

Onderwijsvorm
Lectures, exercises, case-studies

Toetsvorm
Written examination(s) and assignments.

Literatuur
Pharmacology in Drug Discovery and Development 2nd edition - T.P. Kenakin
eBook ISBN: 9780128037539
Paperback ISBN: 9780128037522

Scientific papers (primary and review) provided during the course

Aanbevolen voorkennis
Knowledge of basic principles of drug action and mathematics (i.e. re-arranging formulas and understanding of (non)linear equations).

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)	J.C. Vos, 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,
• role of mitochondria in necrosis and apoptosis,
• impairment of cell proliferation and tissue repair,
• immune-mediated toxicity.

Onderwijsvorm
Lectures, assignment and self study.

Toetsvorm
Written exam and assignment

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

Recent literature will be provided

Vereiste voorkennis
Bachelor Pharmaceutical Sciences, Biomedical Sciences , Medical Natural Sciences, Medical Biology or equivalent

Doelgroep
Master students Drug Discovery and Safety and Biomolecular Sciences

Intekenprocedure
Registration by VU-Net

Epidemiology

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

Doel vak
To be able to describe the key characteristics, strengths and weaknesses of traditional epidemiological study designs and select an appropriate study design for a given research question and context;
To be able to understand, calculate, and apply measures of occurrence and association;
To be able to understand and assess possible bias and effect modification;
To be able to understand and apply principles of accuracy in epidemiology;
To gain an understanding of the principles of screening and calculate related measures;
To be able to perform bio statistical analyses with Epi Info and interpret, describe, and present the outcomes.

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

Onderwijsvorm
• Lectures (14 hours)
• Work groups (12 hours)
• Computer practicum (8 hours)
• BPO assignment (8 hours)
• Self-study (remaining time)

Toetsvorm
• Exam (100%)
• Assignment (insufficient/ sufficient)
Both elements need to be sufficient.

Literatuur
Available on Canvas

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

Intekenprocedure
n/a

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

Ethics and Academic Skills

Vakcode	XM_432517 (432517)
Periode	Ac. Jaar (september)
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. J.E. van Muijlwijk-Koezen
Examinator	prof. dr. J.E. van Muijlwijk-Koezen
Niveau	400

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

Inhoud vak
Period: Variable

Ethics and Academic Skills

Vakcode	XM_437556 (437556)
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. J.E. van Muijlwijk-Koezen
Examinator	prof. dr. J.E. van Muijlwijk-Koezen
Niveau	400

Inhoud vak
Ethics and Academic Skills is een benaming voor een breed vakgebied. Academic skills zijn beschreven in de zogenaamde Dublin descriptoren: kennis en inzicht, toepassen van kennis en inzicht, oordeelsvorming, communicatie en leervaardigheden. De genoemde skills train je tijdens je masteropleiding op verschillende manieren. Deze cursus zoomt in op de

vaardigheden ontwerp, schrijven en oordeelsvorming. Verantwoord ethisch handelen als onderzoeker komt daarbij als onderdeel aanbod. Aan het eind van de cursus:
- Ken je de basics om een onderwijsopdracht op 100-400 niveau te ontwerpen
- Inzicht in het leerproces
- Herken je de verscheidenheid in leerstijlen
- Heb je inzicht in het koppelen van leerdoelen aan leeractiviteiten en toetsing
- Kun je het niveau van leeractiviteiten beoordelen
- Kun je afwegingen maken die ten grondslag liggen aan het opstellen van een goede rubrics als wijze van beoordeling van toetsen.
- Ken je de richtlijnen voor ethisch verantwoorde wetenschapsbeoefening
- Heb je deze richtlijnen in verschillende fictieve situaties getoetst en keuzes in handelen beoordeeld

Onderwijsvorm
Aangezien bewezen is dat doceren de beste methode is om zélf kennis en inzicht op te doen, worden in dit vak onderwijsopdrachten ontworpen en wordt de werkwijze daarbij intensief bestudeerd. Zelfreflectie en feedback spelen hierbij een belangrijke rol. Stapsgewijs ontwerp je leeractiviteiten op basis van leerdoelen. Je ontwerpt, bespreekt en bediscussieert de verschillende stappen hierin en de manier van toetsing (summatief, formatief). Bij één van de ontworpen toetsen stel je een rubrics op voor de beoordeling van de toets. De producten die je oplevert kunnen mogelijk de basis vormen voor echte onderwijsonderdelen.

Toetsvorm
Introducerend hoorcollege, case studies, onderwijs-ontwerpopdrachten, werkcollege

Intekenprocedure
graag van tevoren contact opnemen met de coördinator

Ethics in Life Sciences

Vakcode	AM_470707 ()
Periode	Periode 3
Credits	3.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	P. Klaassen MA
Examinator	P. Klaassen MA
Docent(en)	dr. J.F.H. Kupper, P. Klaassen MA, A.R. Gilmoor
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	400

Doel vak
To provide a toolbox of ethical instruments to analyze properly moral problems related (to one's own) research in the life sciences and beyond
• To acquire conceptual knowledge of the central concepts in applied philosophy and professional ethics
• To be able to execute an ethical reflection on issues related to one owns life science
specialization and to open it for an impartial and constructive

discussion
• To conduct, as a team based project, a moral dialogue
• To acquire the necessary skills to handle ethical issues in an accountable manner, as a professional academic beyond one's own inclinations and prejudgments
. To show a respectful and accountable attitude in dealing with group dynamics during the work groups and project.

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

Onderwijsvorm
Ethics in the Life Sciences is a fulltime course of four weeks (3 ECTS).
The total study time is 80 hours.
The different elements have the following study time:
• Lectures: 13 hours
• Work groups: 17 hours
• Group assignment: 24 hours
• Exam: 2 hour
• Moral dialogue: 4 hours
• Self working (reading in the first week): 20 hours
Please note that attendance to the work group meetings is compulsory. Attendance to the lectures is highly recommended. In our experience, relying on self-study alone is insufficient to apply the theory of the lectures in the assignments of the workgroups, and to pass the exam.

Toetsvorm
• Degree of intellectual participation in the workgroups (10%)
• exam (50%)
• written and verbal execution of the ethical dialogue (40%)
All three elements have to be passed

Literatuur
Available on Canvas

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

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

Overige informatie
Lectures in English, Most of the work groups are in Dutch. Non Dutch speaking students will be placed in English work groups. All presentations and plenary discussions in English.
In order to maximize the experience of differences in values and preferences, and to increase meaningful ethical inquiry we will place you randomly in the workgroups. Placement will be communicated after the introduction lecture.

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, Werkcollege
Niveau	500

Doel vak
In depth study on the High Throughput Screening (HTS), drug target, bioassay development, bio-analytical and high content 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, drug target classes, assay development, 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, prior to, or directly after the lectures, relevant literature per lecture will be provided. This literature is mainly from e-books (chapters) and from academic papers/reviews. All literature that has to be studied will be provided in the course documents section on Canvas. All literature provided on Canvas is part of and has to be studied for the written examination. All students will work on an assignment related to a topic in high throughput screening. This assignment results in a Word document and a PowerPoint presentation.

Toetsvorm
Examination is in the form of a written examination accounting for 50% of the final mark (depending on the number of students entering the course, optionally the written examination can be changed into an oral examination). 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 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 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 (mark of 5.5 or higher).If more than 12 students join this course, students will form groups of three students for the assignment document and presentation (Otherwise groups of two students will be formed).

Literatuur
Electronically provided Course Documents. The PowerPoint presentation named "HTS Course Overview" gives a detailed explanation/overview of the lectures, tutorials and course structure. All PowerPoint lectures will be provided electronically at least one day before each lecture. All PDF e-book chapters and other literature (e.g. academic research papers and reviews) will also be provided electronically.

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

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

Internship abroad DDS Biomol. Drug Analysis

Vakcode	XM_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	XM_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 rol 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 theoreical 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	XM_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 insigh into the rol 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	XM_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	XM_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	XM_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	XM_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	XM_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	XM_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	XM_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, DD&S

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	XM_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, DD&S

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	XM_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, DD&S

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	XM_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

Intekenprocedure

For this part of the Masterprogramma, no central registration is required. This will be arranged via the Mastercoordinator / Internship coordinator

Overige informatie
Please contact the coordinator well in advance.

Internship abroad DDS Drug Disc. & Target Find.

Vakcode	XM_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

Intekenprocedure
For this part of the Masterprogramma, no central registration is required. This will be arranged via the Mastercoordinator / Internship coordinator.

Overige informatie
Please contact the coordinator well in advance.

Internship abroad DDS Drug Disc. & Target Find.

Vakcode	XM_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

Intekenprocedure
For this part of the Masterprogramma, no central registration is required. This will be arranged via the Mastercoordinator / Internship coordinator.

Overige informatie
Please contact the coordinator well in advance.

Internship abroad DDS Drug Disc. & Target Find.

Vakcode	XM_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

Intekenprocedure
Voor deze onderdelen van de Master is geen centrale intekening nodig.
Deze onderdelen worden via Mastercoördinator/Stagecoördinator geregeld.

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

Vakcode	XM_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.

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.

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

Doelgroep
Student master Drug Discovery and Safety, track Drug Disposition and Safety Assessment

Intekenprocedure
Contact mastercoordinator dr. J.N.M. Commandeur (j.n.m.commandeur@vu.nl)

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).

Lecturers:
dr. J.N.M. Commandeur
dr. J.C. Vos

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

Vakcode	XM_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.

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.

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

Doelgroep
mDDS-DDSA

Intekenprocedure
Contact mastercoordinator dr. J.N.M. Commandeur (j.n.m.commandeur@vu.nl)

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).

Lecturers:
dr. J.N.M. Commandeur
dr. J.C. Vos

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

Vakcode	XM_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.

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.

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

Doelgroep
Student master Drug Discovery and Safety, track Drug Disposition and Safety Assessment

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).

Lecturers:
dr. J.N.M. Commandeur
dr. J.C. Vos

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

Vakcode	XM_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.

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.

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

Doelgroep
Student master Drug Discovery and Safety, track Drug Disposition and Safety Assessment

Intekenprocedure
Contact mastercoordinator dr. J.N.M. Commandeur (j.n.m.commandeur@vu.nl)

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).

Lecturers:
dr. J.N.M. Commandeur
dr. J.C. Vos

Literature thesis and Colloquium

Vakcode	XM_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 coödinator.

Literature thesis and Colloquium DDS Medical Chemistry, DD&S

Vakcode	XM_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 well in advance for a discussion and planning of the topic.

Finalizing a literature thesis during summer break months is not possible.

Literature thesis and Colloquium DDS Molecular Toxicology, DDSA

Vakcode	XM_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).

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

Literatuur
Literature study

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

Doelgroep
Student master Drug Discovery and Safety, track Drug Disposition and Safety Assessment

Intekenprocedure
Contact mastercoordinator dr. J.N.M. Commandeur (j.n.m.commandeur@vu.nl)

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)

Lecturers:
dr. J.N.M. Commandeur
dr. J.C. Vos.
prof.dr. P. Jennings

Major Research Project Biomol. Drug Analysis

Vakcode	XM_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 ussues 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	XM_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 wirh 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	XM_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	XM_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 the 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	XM_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	XM_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.

A traineeship cannot take place if the student has less than 18 EC of passed courses.

Doelgroep
mDDS-DD&S

Intekenprocedure
Please contact the coordinator well in advance.

Major Research Project DDS Medicinal Chemistry, DD&S

Vakcode	XM_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.

A traineeship cannot take place if the student has less than 18 EC of passed courses.

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	XM_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.

A traineeship cannot take place if the student has less than 18 EC of passed courses.

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	XM_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.

A traineeship cannot take place if the student has less than 18 EC of passed courses.

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	XM_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.

A traineeship cannot take place if the student has less than 18 EC of passed courses.

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	XM_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

Intekenprocedure
Voor deze onderdelen van de Master is geen centrale intekening nodig.
Deze onderdelen worden via Mastercoördinator/Stagecoördinator geregeld.

Major Research Project DDS Molecular Toxicology, CMCT

Vakcode	XM_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

Major Research Project DDS Molecular Toxicology, DDSA

Vakcode	XM_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 thsi 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 and development of novel in vitro models for liver and kidney toxicity.

Onderwijsvorm
Experimental research project, starting with a 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 related to the research topic will be provided.

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

Doelgroep
mDDS-DDSA

Intekenprocedure
Contact mastercoordinator dr. J.N.M. Commandeur (j.n.m.commandeur@vu.nl)

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.

Lecturers:
dr. J.N.M. Commandeur
dr. J.C. Vos

Major Research Project DDS Molecular Toxicology, DDSA

Vakcode	XM_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 thsi 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 and development of novel in vitro models for liver and kidney toxicity.

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.

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

Doelgroep
Students master Drug Discovery and Safety, track Drug Disposition and Safety Assessment

Intekenprocedure
Contact mastercoordinator dr. J.N.M. Commandeur (j.n.m.commandeur@vu.nl)

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.

Lecturers:
dr. J.N.M. Commandeur
dr. J.C. Vos

Major Research Project DDS Molecular Toxicology, DDSA

Vakcode	XM_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 thsi 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 and development of novel in vitro models for liver and kidney toxicity.

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.

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

Doelgroep
Students master Drug Discovery and Safety, track Drug Disposition and Safety Assessment

Intekenprocedure
Contact mastercoordinator dr. J.N.M. Commandeur (j.n.m.commandeur@vu.nl)

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.

Lecturers:
dr. J.N.M. Commandeur
dr. J.C. Vos

Major Research Project DDS Molecular Toxicology, DDSA

Vakcode	XM_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 thsi 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 and development of novel in vitro models for liver and kidney toxicity.

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.

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

Doelgroep
Student master Drug Discovery and Safety, track Drug Disposition and Safety Assessment

Intekenprocedure
Contact mastercoordinator dr. J.N.M. Commandeur (j.n.m.commandeur@vu.nl)

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

Lecturers:
dr. J.N.M. Commandeur
dr. J.C. Vos

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

Vakcode	XM_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 thsi 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 and development of novel in vitro models for liver and kidney toxicity.

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.

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

Doelgroep
Students master Drug Discovery and Safety, track Drug Disposition and Safety Assessment

Intekenprocedure
Contact mastercoordinator dr. J.N.M. Commandeur (j.n.m.commandeur@vu.nl)

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.

Lecturers:
dr. J.N.M. Commandeur
dr. J.C. Vos

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

Vakcode	XM_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

Intekenprocedure
Voor deze onderdelen van de Master is geen centrale intekening nodig.
Deze onderdelen worden via Mastercoördinator/Stagecoördinator geregeld.

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

Vakcode	XM_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

Intekenprocedure
Voor deze onderdelen van de Master is geen centrale intekening nodig.
Deze onderdelen worden via Mastercoördinator/Stagecoördinator geregeld.

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

Vakcode	XM_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

Intekenprocedure
Voor deze onderdelen van de Master is geen centrale intekening nodig.
Deze onderdelen worden via Mastercoördinator/Stagecoördinator geregeld.

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

Vakcode	XM_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

Intekenprocedure
Voor deze onderdelen van de Master is geen centrale intekening nodig.
Deze onderdelen worden via Mastercoördinator/Stagecoördinator geregeld.

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

Vakcode	XM_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	XM_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	XM_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	XM_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. J.F.H. Kupper, dr. T.J. Schuitmaker-Warnaar, P. Klaassen MA, prof. dr. J.E.W. Broerse, dr. B.J. Regeer
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	600

Doel vak
In this course, students:
• acquire knowledge and understanding of philosophical and social science theories on science and technology development
• gain insight into the mutual shaping of science & technology and society
• acquire knowledge and understanding of the basic concepts and issues in the field of science and technology studies
• acquire knowledge and understanding of technological development through Responsible Research and Innovation
• acquire knowledge and understanding of interactive methods for directing and guiding developments in science and technology
• gain insight into the need for democratization of science and technology
• learn to recognize and operate the central STS concepts in their own life worlds
• learn to communicate verbally and in scientific writing about their

knowledge and understanding and to critically reflect on that

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

As a MPA student you are trained to operate at the interface of your natural science discipline and society, thereby making a contribution to answering the complex social problems arising in these areas. At the dawn of the 21st century, technology and science have an enormous potential for transforming life on earth. At the same time, the dimensions of our human culture shape the directions in which science and technology develop. The production of scientific knowledge and technological artefacts can solve some of our problems, but at the same time they give rise to new problems. During this course you will study the interactions of science and technology with society, and the various ways in which they mutually shape one another. These interactions invoke a lot of questions. Should we embrace genetically modified food? How do new human reproductive technologies interfere with the way we deal with sexuality and social responsibilities?

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

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

The different elements have the following study time:
o lectures 22 hours
o work groups 12 hours
o group project 32 hours
o self study (including mini-essays) 86 hours
o examination (take-home) 16 hours

Toetsvorm
The examination consists of:
- Mini-essay 1 (20%)
- Mini-essay 2 (20%)
- Final essay (take-home essay exam) (40%)
- SCOB-project (20%)

Both the essay exam and the SCOB project need to be passed.

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

Doelgroep

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

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

Minor Research Project Biomol. Drug Analysis

Vakcode	XM_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	XM_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 Biomolecular Drug Analysis

Vakcode	XM_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 objctive 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 DDS Medicinal Chemistry, DD&S

Vakcode	XM_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, mChem

Intekenprocedure
Please contact the coordinator well in advance.

Minor Research Project DDS Medicinal Chemistry, DD&S

Vakcode	XM_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, mChem

Intekenprocedure
Please contact the coordinator well in advance.

Minor Research Project DDS Medicinal Chemistry, DD&S

Vakcode	XM_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, mChem

Intekenprocedure
Please contact the coordinator well in advance.

Minor Research Project DDS Molecular Toxicology, CMCT

Vakcode	XM_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	XM_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 thsi 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 and development of novel in vitro models
for liver and kidney toxicity.

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.

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

Doelgroep
Students master Drug Discovery and Safety, Biomolecular Sciences and Chemistry.

Intekenprocedure
Contact mastercoordinator dr. J.N.M. Commandeur (j.n.m.commandeur@vu.nl)

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.

Lecturers:
dr. J.N.M. Commandeur
dr. J.C. Vos

Minor Research Project DDS Molecular Toxicology, DDSA

Vakcode	XM_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 thsi 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 and development of novel in vitro models for liver and kidney toxicity.

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.

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

Doelgroep
Masterstudents Drug Discovery and Safety, Bimolecular Sciences and Chemistry

Intekenprocedure
Contact mastercoordinator dr. J.N.M. Commandeur (j.n.m.commandeur@vu.nl)

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.

Lecturers:
dr. J.N.M. Commandeur
dr. J.C. Vos

Minor Research Project DDS Molecular Toxicology, DDSA

Vakcode	XM_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 and development of novel in vitro models for liver and kidney toxicity.

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.

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

Doelgroep
Students master Drug Discovery and Safety, Bimolecular Sciences and Chemistry.

Intekenprocedure
Contact mastercoordinator dr. J.N.M. Commandeur (j.n.m.commandeur@vu.nl)

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.

Lecturers:
dr. J.N.M. Commandeur
dr. J.C. Vos

Minor Research Project DDS, CMCT

Vakcode	XM_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	XM_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	XM_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

Intekenprocedure
Voor deze onderdelen van de Master is geen centrale intekening nodig.
Deze onderdelen worden via Mastercoördinator/Stagecoördinator geregeld.

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

Vakcode	XM_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

Intekenprocedure
Voor deze onderdelen van de Master is geen centrale intekening nodig.
Deze onderdelen worden via Mastercoördinator/Stagecoördinator geregeld.

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

Vakcode	XM_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

Intekenprocedure
Voor deze onderdelen van de Master is geen centrale intekening nodig.
Deze onderdelen worden via Mastercoördinator/Stagecoördinator geregeld

Molecular Computational Chemistry

Vakcode	X_435666 (435666)
Periode	Periode 5
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. C. Fonseca Guerra
Examinator	dr. C. Fonseca Guerra
Docent(en)	prof. dr. F.M. Bickelhaupt, dr. C. Fonseca Guerra
Lesmethode(n)	Hoorcollege, Practicum
Niveau	400

Inhoud vak
http://studiegids.uva.nl/xmlpages/page/2017-2018/zoek-vak/vak/31657

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

Peergroup fase 1

Vakcode	O_MLPEERGR_1 ()
Periode	Periode 1+2+3
Credits	0.0
Voertaal	Nederlands
Faculteit	Fac. der Gedrags- en Bewegingswetensch.
Coördinator	drs. I. Pauw
Examinator	dr. A. Handelzalts
Lesmethode(n)	Werkgroep
Niveau	400

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

Peergroup Fase 2

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

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

Physical-Organic Chemistry

Vakcode	X_435663 (435663)
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J.C. Slootweg
Examinator	dr. J.C. Slootweg
Docent(en)	prof. dr. F.M. Bickelhaupt
Lesmethode(n)	Hoorcollege, Werkcollege
Niveau	400

Inhoud vak
http://studiegids.uva.nl/xmlpages/page/2017-2018/zoek-vak/vak/31642

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

Policy, Politics and Participation

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

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

Inhoud vak
In this course you get the chance to gain experience in the practical implementation of a prominent methodology for interactively investigating complex societal problems: focus group research. In a research project aimed at the development of policy recommendations concerning such complex problem, 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 political theory. In a group of eight to twelve students you will participate in an interactive research project executed at the Athena institute (possibly with a real external client). 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 present your findings and recommendations orally.

In parallel to the group work for your research project, you will follow lectures, attend and prepare for guest lectures by people active in the

field of policy-making, and actively participate in seminars following the so-called "CARQ"-methodology. During these CARQ-seminars literature is studied and discussed via the identification of a Core quotation, an analysis of the Argumentative structure of the paper at issue, the identification and articulation of pertinent Relations the paper has with other material/ issues/ papers/ methodologies/..., and, finally Questions that elicit in-depth discussions of topics pertinent to the course.

Onderwijsvorm
Lectures: 18 hours
Training workshops: 19 hours
CARQ seminars: 24 hours
Project assignment: 80 hours
focus group execution: 6 hours
Final presentations project results: 4 hours
Self study and assignment: remaining hours

Toetsvorm
The course does not have an exam. You will be assessed on the basis of the group assignment, a group presentation, your individual performance during the course and a take-home assignment. More precisely:

Individual grade [45%]:
CARQ facilitation and participation (10%)
Focus group facilitation (10%)
Participation (10%)
Take-home assignment (15%)

Group grade [55%]:
Focus group design and execution (20%)
Presentation (including analysis, policy recommendations and discussion) (35%)

For all group assignments a pass grade (> 5.5) needs to be obtained in order to receive a final mark. For individual assignments a resit can be done.

Literatuur
To be announced on Canvas

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. Mandatory course for MPA students who specialize in Policy.

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

Overige informatie
Attendance is compulsory. (You will spend a great deal of your time on team work.)

Praktijk 1

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

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

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

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

Praktijk 2

Vakcode	O_MLPRAK_2 ()
Periode	Periode 2+3
Credits	9.0
Voertaal	Nederlands
Faculteit	Fac. der Gedrags- en Bewegingswetensch.
Coördinator	dr. A. Handelzalts
Examinator	drs. Y.G. Meindersma

Docent(en)	drs. J.K.W. Riksen, drs. H.R. Goudsmit, drs. Y.G. Meindersma, ir. E.J.F. Scheringa, drs. C.D.P. van Oeveren, drs. S. Donszelmann, dr. H.B. Westbroek, C.L. Geraedts, dr. A.A. Kaal, dr. A. Handelzalts, drs. A.J.C. Monquil, drs. J.B. Penninx, drs. L.A. van der Bruggen, W. Maas, drs. H. Stouthart, drs. N.H. Ypenburg, drs. E.D. van Noort, F.L. de Vries, drs. J. Quartel MA
Lesmethode(n)	Werkgroep
Niveau	400

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

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

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

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

Praktijk 3

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

Inhoud vak
In het verdiepingsdeel gaat de student meer en meer zelf(standig) lesgeven. De voorbereiding en evaluatie wordt samen met de werkplekbegeleider gedaan. Op de werkplek komen dezelfde onderwerpen aan de orde als in het instituut: vakdidactische verdieping van

onderwijsconcepten en –strategieën, aandacht voor het afstemmen van onderwijs op de behoeften van individuele leerlingen, diversiteit en excellentie.

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

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

Toetsvorm
Voor de beoordeling van Praktijk 3 maakt de student in blok 6 een afspraak met zijn WPB en SO voor een afrondend lesbezoek. In overleg met de WPB en SO bepaalt de student welke klas hiervoor het meest geschikt is.
Na afloop van het lesbezoek blikken WPB en SO met de student terug op de les. WPB en SO beoordelen de les aan de hand van de checklist (rubric). Gecombineerd met het oordeel van vakdidacticus aan de hand van de tweede lesbezoek wordt een cijfer vastgesteld.

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

Praktijk 3 voor 2-jarige Master

Vakcode	O_M2PRAK3 ()
Credits	15.0
Faculteit	Fac. der Gedrags- en Bewegingswetensch.
Coördinator	dr. A. Handelzalts
Examinator	dr. A. Handelzalts
Niveau	400

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

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

Onderwijsvorm

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

Toetsvorm
Voor de beoordeling van Praktijk 3 maakt de student in blok 6 een afspraak met zijn WPB en SO voor een afrondend lesbezoek. In overleg met de WPB en SO bepaalt de student welke klas hiervoor het meest geschikt is.
Na afloop van het lesbezoek blikken WPB en SO met de student terug op de les. WPB en SO beoordelen de les aan de hand van de checklist (rubric). Gecombineerd met het oordeel van vakdidacticus aan de hand van de tweede lesbezoek wordt een cijfer vastgesteld.

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

Praktijkonderzoek 1

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

Doel vak
Tijdens praktijkonderzoek 1 en 2 vullen studenten de tijdens hun master opgedane onderzoeksvaardigheden aan met onderzoeksvaardigheden voor de eigen onderwijspraktijk.

Inhoud vak
In praktijkonderzoek 1 richt de opdracht zich primair op het leren herkennen, waarderen en gebruiken van verschillen type bronnen (praktijkbronnen, vakliteratuur en wetenschappelijke literatuur) om praktijkproblemen te analyseren en te duiden. Studenten krijgen handvatten aangereikt om bronnen te zoeken en te beoordelen op kwaliteit en bruikbaarheid voor de (eigen) praktijk.

Onderwijsvorm
De begeleiding vindt plaats op het instituut en bestaat uit de volgende vormen: college en werkcolleges.

Toetsvorm
Praktijkonderzoek 1 wordt afgesloten met een onderbouwd advies voor de (eigen) praktijk

Literatuur
Relevante en actuele artikelen over verschillende kernpraktijken die in fase 1 en 2 aan de orde zijn geweest. De artikelen worden beschikbaar gesteld, en zelf opgezocht

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

Praktijkonderzoek 2

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

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

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

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

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

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

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

Principles of Pharmaceutical Sciences / Pharmacochemistry

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

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

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

Onderwijsvorm
Lectures and tutorials.

Toetsvorm
Written examination

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

Doelgroep
3S, 3MNW, mCh, mPhys.
The course is optional for mDDS students that did not follow the VU University BSc Pharmaceutical sciences and these mDDS students should contact the mDDS coordinator before enrolling.
The course is recommended for SBI (life) mastertrack students, except for students with an bachelor in SBI or pharmaceutical sciences.

Project Computational Design and Synthesis of Drugs

Vakcode	X_432734 ()
Periode	Periode 4
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)	dr. M. Wijtmans, 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 heteroatoromatic 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.

Teachers: Dr. C. de Graaf, Dr. M. Wijtmans, Dr. D.P. Geerke, Prof. Dr. De Esch.

Toetsvorm
Written exam (50%), case study report (50%). Both the exam and the case study report should be passed.

Literatuur
Two eBooks contain several chapters of literature. These two books are:

Mason: Volume 4 of Comprehensive Medicinal Chemistry II: Computer-Assisted Drug Design (Mason (Ed.).
http://www.sciencedirect.com/science/referenceworks/9780080450445

Hoffmann: Elements of Synthesis Planning (Hoffmann (Ed))
http://www.springerlink.com/content/j81646

These books are accessible through UBVU at all VU computers. The same holds true for articles and the Reaxys search engine (vide infra). When at home, turn on the VU-proxy (http://www.ub.vu.nl/nl/faciliteiten/thuis-werken/index.asp) and accessibility to all these items is maintained.
The following book (Clayden) is not an eBook accessible through UBVU, but it contains useful background literature on organic chemistry. All students that received their FAR BSc degree at the VU possess this book. It is suggested by us that such students could consider lending this book to others if necessary.

Clayden: Clayden, Organic Chemistry, Oxford University Press, 2001.

In the remainder of the guide, a distinction is made between integral literature and background literature.
Integral literature represents literature that is considered integral to the topic and hence is exam material.
Background literature either constitutes material for certain assignments or offers a wider or alternative discussion of the topic that an interested student can read at his/her own leisure. Background literature is not exam material.

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, Werkcollege
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.

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

Reflective Practice Internship Science Communication

Vakcode	AM_1163 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. J.F.H. Kupper
Niveau	600

Doel vak
The internship is a compulsory part of the Master’s programme. The aims of the internship are:
• Learn to independently apply and expand your practical science communication skills in one particular area of the field (writing, multi-media, facilitation, policy and strategy development, content design, etc.).

• Critical self-assessment and reflection on acquired science communication competencies in the field.
• Conduct scientific research independently: assess scientific information, design a research project, apply scientific methods, collect data, report and discuss findings.
• Present and discuss about internship and research outcomes.
• Learn to cooperate with researchers and practitioners of various disciplines.
• Gain an impression of a potential future field of career.

Inhoud vak
When you are enrolled in the VU Science Communication specialization or the UvA Major Science Communication you need to conduct one internship (30 ECTS, 5 months). One of the two possible formats is the Reflective Practice Internship (RPI). The complete and up-to-date information about the internship can be found in the SC internship guide line on Canvas (science communication community).

Onderwijsvorm
Work-based placement

Toetsvorm
Written report and oral presentation.
Within six weeks after the start of the master internship, an interim evaluation will take place to assess whether there is a reasonable chance of the placement being brought to a successful completion.
The internship is supervised and assessed by two lecturers. Both lecturers are members of the academic staff at VU University Amsterdam. The day-to-day supervision can be carried out by a trainee research assistant (AIO), postdoc or researcher.

Doelgroep
Students MSc Earth science year 2

Overige informatie
Participation in this compulsory component is only permitted if the student meets the relevant requirements for admission. These requirements are detailed in the Internship guidelines of Earth science (on
Canvas) and in the Academic and Examination Regulations.
The work-based placement is subject to the FALW document: “Student placement (internship) and literature regulations”. These regulations require detailed written agreements between supervisors and student that specify the conditions for the Master research project. This agreement should be sent for approval by the science communication co-ordinator at least two weeks before the planned start of the work-based placement. If the proposal is of sufficient quality, you can start your internship. If not, you’ll need to adapt your proposal and send it for approval again. You can only start your internship after your research design has been approved.
The placement may be extended by 6 EC, subject to conditions that can be found in the FALW document “Student placement (internship) and literature regulations”. The student must send a request for extension to the Earth science Examination Board.
Information on Master internships is made available on Canvas.

Research Internship Science Communication

Vakcode	AM_1162 ()
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. J.F.H. Kupper
Niveau	600

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

Inhoud vak
When you are enrolled in the VU Science Communication specialization or the UvA Major Science Communication you need to conduct one internship (30 ECTS, 5 months). One of the two possible formats is the full Research Internship. The complete and up-to-date information about the internship can be found in the SC internship guide line on Canvas (science communication community).

Onderwijsvorm
Work-baed placement

Toetsvorm
Written report and oral presentation.
Within six weeks after the start of the master internship, an interim evaluation will take place to assess whether there is a reasonable chance of the placement being brought to a successful completion.
The internship is supervised and assessed by two lecturers. Both lecturers are members of the academic staff at VU University Amsterdam. The day-to-day supervision can be carried out by a trainee research assistant (AIO), postdoc or researcher.

Doelgroep
Students Earth science year 2

Overige informatie
Participation in this compulsory component is only permitted if the student meets the relevant requirements for admission. These requirements are detailed in the Internship guideline of science communication (on
Canvas) and in the Academic and Examination Regulations.
The work-based placement is subject to the FALW document: "Student

placement (internship) and literature regulations". These regulations require detailed written agreements between supervisors and student that specify the conditions for the Master research project. This agreement should be sent for approval by the science communication internship or master co-ordinator
at least two weeks before the planned start of the work-based placement. If the proposal is of sufficient quality, you can start your internship. If not, you'll need to adapt your proposal and send it for approval again. You can only start your internship after your research design has been approved.
The placement may be extended by 6 EC, subject to conditions that can be found in the FALW document "Student placement (internship) and literature regulations". The student must send a request for extension to the earth science Examination Board.
Information on Master internships is made available on Canvas.

Research methods for analyzing complex problems

Vakcode	AM_1182 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	drs. D.H.J. Lynch
Examinator	A. van Luijn MSc
Docent(en)	J.W. Schuijer, drs. ir. A. Fraaije, A.E. Bunders MSc, drs. ir. F. Vogels
Lesmethode(n)	Hoorcollege, Werkcollege, Computerpracticum, Deeltoets extra zaalcapaciteit
Niveau	400

Doel vak
The objectives of this course are:

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

Inhoud vak
Contemporary societies increasingly face complex social problems, such as climate change, HIV/ AIDS or ethnic and religious diversity. These complex problems involve a variety of social actors: policy-makers, professionals, NGOs, industries, science and, of course, the public at large. Addressing these complex issues demands an approach that

investigates, analyzes and integrates the positions and knowledge of different actors.

This course offers an (advanced) introduction to various research methods used in real world research, including questionnaires, surveys, semi-structured
interviews, and focus groups. These methods are commonly used in research into complex problem contexts, communication and opportunities for intervention. Strengths and weaknesses of each research method and technique will be discussed, as well as its possibility to be applied in different societal contexts.

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

The different elements have the following study time:
- lectures 20 hours
- workgroups and training 36 hours
- examination 3 hours
- project work & reading (self-study) Remaining hours

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

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

Toetsvorm
The course grade is based on the group assignment 'research design' and the exam. Both aspects need to be graded 6.0 or higher.
Exam 50% of total grade
Group assignment 'research design' 50% of total grade

Literatuur
The literature of this course consists of selected scientific articles that are provided on Canvas, and the books:
- Verschuren, D.E. and Doorewaard, H. (2010). Designing a Research Project
(2nd edition)Eleven International Publishing, the Hague. ISBN 978-90-5931-572-3.
- Gray, D.E. (2014) Doing Research in the Real World (3rd edition)Sage Publications Ltd, United Kingdom. ISBN 978-1-4462-6019-7

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

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

program students at the VU University.

Intekenprocedure
VUnet

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

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

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

Contact:
Durwin Lynch (d.lynch@vu.nl)

Research Skills and Career Perspectives

Vakcode	XM_0002 ()
Periode	Ac. Jaar (september)
Credits	0.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. D.J. Scholten
Examinator	dr. D.J. Scholten
Lesmethode(n)	Hoorcollege

Science and Communication

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

Doel vak
a) Gain theoretical insight in the nature of science,
b) Gain theoretical insight in the nature of communication,
c) Gain theoretical insight in the relationship between science and society,

d) Gain insight in the role of science communication in this relationship,
e) Acquire knowledge of different theories and models of science communication,
f) Acquire knowledge of different strategies, media and activities for science communication,
g) Learn how to practically apply theoretical concepts from the field of science communication in communicating science,
h) Develop practical skills for science communication (especially writing and giving oral presentations).
i) Reflect on your own knowledge and competencies pertinent to your projected (ideal) role as science communicator.

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

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

Onderwijsvorm
Lectures (18 h)
Workgroups (15 h)
Home-study for group assignments (12 h)
Home-study for individual assignments/exam (100 h)

Toetsvorm
a) Participation. (10%)
This consists of the following:
- (small) individual assignments,
- a pitch presentation and
- a "job application".
All these are assessed as pass or fail. If you pass all of them, you have earned the first 10% of your final mark. For each one you fail, you have to do an alternative assignment.
Nota bene: if you fail your participation, this cannot be compensated with an alternative assignment!
b) A group assignment in which you develop a label to an exhibit at a science museum and write an accompanying essay. (10%)
c) A review of a science communication effort of your own choosing (an exhibit at a science center or museum, a public lecture, a (popular) science book, et cetera...). (10%)
d) "TED-talk" in which you present the research you did (e.g. for your Bsc thesis or (first) Msc internship). (20%)

e) Exam. (50%)

To pass, your grades for assignments (a), (b) and (e) have to be 6 or higher. Assignments (b), (c) and (d) are all mandatory, but grades for these individual components can be compensated by other grades.

Resit:
In case your weighed average of (a) to (e) (with sufficient grades for (a), (b) and (e)!) is not sufficient, you have to take a resit. This can either consist of a second attempt at (c) or (d), or a re-exam.

Literatuur
Academic articles. Direct links to articles will be provided on Canvas.

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

Science in Dialogue

Vakcode	AM_1002 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. J.F.H. Kupper
Examinator	dr. J.F.H. Kupper
Docent(en)	dr. J.F.H. Kupper
Lesmethode(n)	Werkgroep, Hoorcollege, Werkcollege
Niveau	500

Doel vak
To gain knowledge of and insight into:
- the basic concepts and issues in the understanding of science-society interactions, both from a science and technology studies and communication science perspective
- the nature and course of interpersonal and group communication processes relevant to the formal and informal dialogue between science and society
- the nature and form of dialogical science communication, aimed at reflective learning and mutual understanding

To acquire or improve:
- individual skills for effective interpersonal communication
- individual skills for the design and facilitation of the science-society dialogue

Inhoud vak
This course examines the public character of scientific controversy and focuses on the communicative aspects of a fruitful science-society dialogue. At the dawn of the 21st century, science, and particularly fields that combine science and engineering such as nanotechnology and

synthetic biology, holds a great promise for the progress of our societies. At the same time, these developments are controversial. They lead to a variety of concerns related to risks, benefits and wider moral issues. Nanotechnology creates materials with novel characteristics that help us, but may also contain risks for health and environment. Synthetic biology develops new biological systems that may be very useful, but radically change the nature and meaning of life. Clearly, advances in science do not always match the needs, desires and expectations of society. On the other hand, parts of society might not always appreciate the nature and scope of scientific findings. For a fruitful relationship between science and society, a constructive science-society dialogue is necessary.
This course offers advanced lectures on the basic concepts and issues of dialogical science communication: communication, learning, dialogue, understanding, controversy, democracy. A series of workshops and small group assignments presents communicative tools and spaces such as discussion games, science theatre and multimedia platforms that can be used to design and facilitate science-society interactions. Training workshops will focus on improving the students' individual communication and facilitation skills. The students' individual learning curve as a science communicator and facilitator is self-evaluated by means of a refle ction report.
Every course week is completed with a mini-exam.

Onderwijsvorm
Lectures (14h), Workgroups (28h), Training workshops (24h), Dialogue presentations (12h), Selfstudy
(remaining hours)

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

Literatuur
Is announced on Canvas one month before start of the course

Doelgroep
Optional course in the MSc specialization Science Communication

Overige informatie
Independence and a cooperative attitude is expected. Attendance to training workshops is mandatory.

Science Journalism

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

Doel vak
To acquire knowledge of and insight into:
- the concepts, models and issues of science journalism according to contemporary scientific literature
- the criteria for effective science journalism with respect to diverse media
- the representation of science in the media
- the role of science journalism in the use of scientific knowledge in society

To acquire skills in:
- writing popular scientific texts for different genres such as news, background and interview
- science reporting using videos
- designing science communication for different media such as newspaper, radio and internet

Orientation to the professional practice of science journalism

Inhoud vak
This course teaches the basic principles of science journalism. A series of interactive lectures reviews both the practical as well as the theoretical aspects of science journalism. Topics that are discussed are the translation of science to a language that is both compelling and understandable, the role of journalism in the interaction between science and society, images of science in the media and the ethics of science journalism. The interactive lectures invite you to take your own defendable position with regard to these issues.
Guest lectures provide insight into the professional practice of science journalists. The guest speakers work as freelancer, editor or producer at diverse science media, such as newspapers (NRC, Volkskrant), magazines (NWT), internet (Noorderlicht) and radio (Labyrint).
Finally, the course trains specific skills that you need as a science journalist, such as popular writing, popular science videos, interviewing, conceptual analysis
and program design.

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

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

Literatuur
Announced on Canvas 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	A. van Luijn MSc
Examinator	dr. ir. M.G. van der Meij
Docent(en)	dr. B.J. Regeer, dr. ir. M.G. van der Meij
Lesmethode(n)	Hoorcollege, Werkgroep, Werkcollege, Veldwerk
Niveau	500

Doel vak
- Analyze and understand the role of museum exhibits in the field of science communication.
- Analyze and understand the role of science communication concepts in the context of science museums.
- Synthesize theoretical notions of science communication and exhibit design into ideas for an exhibit experience and exhibit content.
- Create and conduct a qualitative user research method in science museum settings.
- Integrate the user research outcomes into the exhibit experience and exhibit content.
- Reflect on 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.
Lecturers give insight into the role and work of (1) science communicators in museums and science centers, (2) researchers in the field of museology, and/or (3) 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 an exhibit design. The group assignments are commissioned by museums and science centers, such as NEMO, Museon, Naturalis, Delft Science Centre, or Artis.

Onderwijsvorm
Lectures
Workgroups
Workshops
Home-study for group assignments
Home-study for individual assignments
Field work

Toetsvorm
Group assignments (45%), final presentation (15%), and individual assessment(s) (40%). For all assignments and assessments a pass-grade must be obtained.

Literatuur
Academic articles. Direct links to articles will be provided on Canvas before the beginning of the course.

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

Aanbevolen voorkennis
We recommend to follow this course, at least, after having done the course Science & Communication.
We ask non-SC students to read Van Dam, F., De Bakker, L, & Dijkstra, A.M. (2014). Wetenschapscommunicatie, een kennisbasis. Boom Lemma uitgevers. ISBN: 978-94-6236-424-0. Chapters: 1, 2, 3, 4, 5 en 6. For English introduction literature, please contact the teaching staff.

Doelgroep
Optional course in the Science Communication master specialisation of most of the two-year master programs of the FALW and FEW faculties. Master students from other universities in any scientific field are welcome as well. Additional reading may be required.

Overige informatie
Guest lectures from and excursions to for instance NEMO, Artis, Naturalis, NorthernLight, or 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, Werkgroep
Niveau	400

Doel vak
The aim of this course is to provide Master's students with the essential linguistic know-how for writing a scientific article in English that is well organized, idiomatically and stylistically appropriate and grammatically correct.
At the end of the course students
know how to structure a scientific article;
know what the information elements are in parts of their scientific article;
know how to produce clear and well-structured texts on complex

subjects;
know how to cite sources effectively;
know how to write well-structured and coherent paragraphs;
know how to construct effective sentences;
know what collocations are and how to use them appropriately;
know how to adopt the right style (formal style, cohesive style, conciseness, hedging)
know how to avoid the pitfalls of English grammar;
know how to use punctuation marks correctly;
know what their own strengths and weaknesses are in writing;
know how to give effective peer feedback.

Final texts may contain occasional spelling, grammatical or word choice errors, but these will not distract from the general effectiveness of the text.

Inhoud vak
The course will start with a general introduction to scientific writing in English. Taking a top-down approach, we will then analyse the structure of a scientific article in more detail. As we examine each section of an article, we will peel back the layers and discover how paragraphs are structured, what tools are available to ensure coherence within and among paragraphs, how to write effective and grammatically correct sentences and how to choose words carefully and use them effectively.

Topics addressed during the course include the following:
Structuring a scientific article
Considering reading strategies: who is your readership? How do they read your text? What do they expect? How does that affect your writing?
Writing well-structured and coherent paragraphs
Composing effective sentences (sophisticated word order, information distribution).
Arguing convincingly – avoiding logical fallacies
Academic tone and style: hedging – why, how, where?
Using the passive effectively
Understanding grammar (tenses, word order, etc.)
Understanding punctuation
Referring to sources: summarising, paraphrasing, quoting (how and when?)
Avoiding plagiarism
Vocabulary development: using appropriate vocabulary and collocations

Onderwijsvorm
Scientific Writing in English is an eight-week course and consists of 2 contact hours a week. Students are required to spend at least 6 to 8 hours of homework per week. They will work through a phased series of exercises that conclude with the requirement to write several text parts (Introduction, Methods, Discussion and Abstract). Feedback on the writing assignments is given by the course teacher and by peers.

Toetsvorm
Students will receive the three course credits when they meet the following requirements:
Students hand in three writing assignments (Introduction, Methods, Discussion)
Students get a pass mark for all writing assignments;
Students provide elaborate peer feedback (Introduction, Methods, Discussion, Abstract);

Students attend at least 7 out of 8 sessions;
Students are well prepared for each session (i.e. do all homework assignments);
Students participate actively in class;
Students do not plagiarise or self-plagiarise.

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

Students are not allowed to use the following texts for the writing assignments:
1. A BSc thesis written in English that's already in article form.
2. A MSc thesis written in English that's already in article form (and that has already been marked).
3. An internship report written in English that's already in article form (and that has already been marked).
4. A paper or report written in English that's already in article form.

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

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

Overige informatie
- To do well, students are expected to attend all lessons. Group schedules are to be found at rooster.vu.nl and on Canvas.
- A VUnet registration for this course automatically gives access to the corresponding Canvas site. Group registration only takes place via Canvas (general groups: registration by students following FALW programmes offering this course; groups assigned to specific studies: registration through programme and course coordinator).
- Make sure Scientific Writing in English does not overlap with another course.
- If you have registered for a group in Canvas, you are expected to attend all sessions (eight). If you decide to withdraw from the course, do so in time in VUnet. This will avoid a 'fail' on your

grade list for not taking part in this course and allows other students to fill in a possible very wanted group spot.
- For specific Canvas matters concerning this course, please contact canvas.beta@vu.nl.
- Full time students with their main registration at VU will be given preferential treatment for placement in this course. For secondary students proof of enrollment is not a guarantee of placement.

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. ir. A.H. de Boer, dr. M.H. Siderius, prof. dr. M.J. Smit, prof. dr. ir. A.H. de Boer
Lesmethode(n)	Hoorcollege
Niveau	500

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 signaling pathway linked to disease. Molecular mechanisms underlying pathology will be addressed and presented. Therapeutic targets within this signaling pathway will be proposed and discussed.

Toetsvorm
Assignment and presentation, written exam.

Literatuur
'Cell signaling', Authors: Wendell Lim, Bruce Mayer, Tony Pawson
ISBN: 9780815342441
Format: Paperback
Publication Date: June 15, 2014

Papers available on Canvas

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

Societal entrepreneurship in health and life sciences

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

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

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

Learning objectives
- Understand the relevance of entrepreneurship and innovation for science disciplines.
- Explain the importance of valorisation of findings from the health and life sciences and business ideas for a knowledge-based economy.
- Outline the financial, social and ecological aspects (sustainable entrepreneurship) of value-adding opportunities.
- Recognize and design opportunities that create economic and social value
- Understand the nature and role of networks in value creation
- Recognize and understand different entrepreneurial processes
- Construct a business plan on how to bring an innovation to the market.

Inhoud vak
This course consists of both a theoretical and a practical component. Both components run simultaneously so that the theoretical knowledge can be applied to the development of the business plan. In the theoretical component you learn about societal entrepreneurship. We address questions such as: What is entrepreneurship? What are societal entrepreneurs? What is the role of innovation in entrepreneurship? What is corporate social responsibility (CSR)? How can we judge the feasibility of entrepreneurial ambitions?

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

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

Schedule and study time
The total study time is 160 hours. The following hours are contact hours:
- Lectures: 42 hours
- Workshops: 14 hours
- Exam: 3 hours
- Writing business plan: 70 hours
- Self-study for remaining hours

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

Literatuur
Business Model Generation (Osteralder & Pigneur, 2010)

Vereiste voorkennis
Proven knowledge of business aspects in the Health and Life Sciences is required (e.g. by having passed the Business Management course).

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.

Intekenprocedure
VU-net registration will close 4 weeks before the start of the course. Students are strongly encouraged to formulate their own health & life sciences related business case to work on. Alternatively, we can arrange for a limited number of real-life business cases to work on.

Overige informatie
Attendance to lectures and working groups is compulsory. Prior knowledge: Business Management in Health and Life sciences.

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.

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.

Doelgroep
mDDS, DD&S

Intekenprocedure
VUNet

Teaching Assistant

Vakcode	XM_432742 ()
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. J.E. van Muijlwijk-Koezen
Examinator	prof. dr. J.E. van Muijlwijk-Koezen
Niveau	400

Doel vak
The main goal is to improve your teaching skills and get familiar with the specific pharmaceutical sciences/chemistry didactics.

Onderwijsvorm
hands on course:
You will become a member of the team of supervisors for practical courses or working classes for undergraduates and assist in the lab or classroom. With the aid of feedback and intervision, you will improve via learning by doing. The theoretical background has been taught in the course 'tutoring students'

Toetsvorm
Execution during the course and concluding reflective session

Vereiste voorkennis
X_432625, period 2, tutoring students

Doelgroep
mDDS, mChem, PhD

Intekenprocedure
Contact your master coordinator IN TIME. the earlier the better

Overige informatie
Limited seats available, fixed periods

Teaching Assistant

Vakcode	XM_432741 ()
Periode	Ac. Jaar (september)
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. J.E. van Muijlwijk-Koezen
Examinator	prof. dr. J.E. van Muijlwijk-Koezen
Niveau	400

Doel vak
the main goal is to improve your teaching skills and get familiar with the specific pharmaceutical sciences/chemistry didactics.

Onderwijsvorm
hands on course:
You will become a member of the team of supervisors for practical courses or working classes for undergraduates and assist in the lab or classroom. With the aid of feedback and intervision, you will improve via learning by doing. The theoretical background has been taught in the course 'tutoring students'

Toetsvorm
Execution during the course and concluding reflective session

Vereiste voorkennis
X_432625, period 2, tutoring students

Doelgroep
mDDS, mChem, PhD

Intekenprocedure
Contact your master coordinator IN TIME. the earlier the better

Overige informatie
Limited seats available, fixed periods

Tutoring Students

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

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

Inhoud vak
The course contains various topics and activities. Students make an analysis of various learning aims as well as prepare, conduct and reflect on a presentation of a pre and post discussion regarding tutorials and practical courses. They will observe and interpret the application of problem solving and coaching models in tutorials and

practical courses. Attention will be paid to strengths and weaknesses in models of teacher-student interaction. An important constituent is the student's analysis of his/her own pattern of communication. Topics on safety and lab journal procedures in practical courses as well as on the grading of lab reports are also included.

Onderwijsvorm
4 consecutive hours per week (seven weeks long):
- Lectures
- Simulations
- Self-study
- Group work

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

Literatuur
Will be provided.

Doelgroep
mDDS

Intekenprocedure
VUnet

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

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