



## Artificial Intelligence MSc

Vrije Universiteit Amsterdam - Faculteit der Exacte Wetenschappen - M Artificial Intelligence - 2014-2015

Research in Artificial Intelligence concerns the analysis and modelling of tasks that are commonly assumed to require human intelligence, as well as the design of systems that can perform or support such tasks. Such research requires a wide variance of activities, from observing and interviewing human expert to designing and implementing computer programs, and creating mathematical models.

Artificial Intelligence integrates computer science with (cognitive) psychology. Other ingredients are biology, linguistics, philosophy and logic, all used to understand and describe the underlying principles of human cognitive processes, including reasoning and natural language understanding. For these reasons Artificial Intelligence is a broad and multi-disciplinary research area.

The programme consists of a Bachelors study (taking 3 years) and a Master study (taking 2 years). The Bachelors study is dedicated to providing the student with a broad and thorough basis in Artificial Intelligence, whereas the Masters provides the student with an opportunity to specialise in an area and further deepen his knowledge of AI in general. Both Bachelors and Masters studies are organised by the Faculty of Sciences in close cooperation with the Faculty of Psychology and Pedagogy, and the Faculties of Arts. Furthermore, the students can follow courses at the Universiteit van Amsterdam. Information about the Bachelor programme can be found in a separate study guide.

Depending on the chosen Master programme the student attends lectures in other faculties, for example Psychology, Linguistics, Economy, Law, Social Sciences, and Biology. Graduation projects vary from practical to rather fundamental, depending on the preferences and capacities of the students. Students can go to companies, research institutes or universities either in The Netherlands or abroad.

Examples of projects and locations, and more information on what such a project entails, can be found at: <http://www.cs.vu.nl/ai> > Term Projects.

Masters in Artificial Intelligence are employed by companies that develop AI-systems either for their own company (for example banks, insurance companies) or in commission for other companies (software companies). Masters in AI are also employed as consultants, for example for the management of knowledge within organisations. Research and education is another area where masters in AI build a future for themselves, for example at universities or research institutes doing research in Artificial Intelligence.

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## Research Variant Cognitive Science

This specialisation focuses on the study of human cognition through computational methods. The programme is organised based on a close collaboration between the Faculty of Sciences (Department of Computer Science) and the Faculty of Psychology and Education (Department of Cognitive Psychology), and indeed includes courses from both departments.

Students in Cognitive Science come from a wide range of backgrounds – including psychology, computer science, artificial intelligence, philosophy, mathematics, neuroscience, and others – but share the common goal, to get a better understanding of the human mind through computational modelling. The developed models can roughly be applied from two perspectives. Firstly, from a more theoretical perspective, cognitive models (e.g., of perception, attention, or decision making) can serve as a useful tool for researchers to gain more insight in the dynamics of cognitive processes by building (and simulating) them. Secondly, from a more practical perspective, cognitive models can serve as a basis for the development of artefacts that either show or understand human-like behaviour. Examples of artefacts that show human-like behaviour are virtual characters in (serious) games, and examples of artefacts that understand human-like behaviour are intelligent support systems in cars or in military domains.

The programme consists of 120 credits

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

Opleidingsdelen:

- [Recommended Optional Courses](#)
- [Compulsory Courses](#)
- [Constrained Choice](#)

## Recommended Optional Courses

Vakken:

Naam	Periode	Credits	Code
<a href="#">Advanced Data Analysis</a>	Periode 4	6.0	P_MADV DAT
<a href="#">Behaviour Dynamics</a>	Periode 2	6.0	X_400113
<a href="#">Comparative Modeling</a>	Periode 6	6.0	X_405091
<a href="#">Experimental Design and Data Analysis</a>	Periode 5	6.0	X_405078
<a href="#">History of digital cultures</a>	Periode 3	6.0	X_418107
<a href="#">ICT4D: Information and communication technology for Development</a>	Periode 5	6.0	X_405101
<a href="#">Internet programming</a>	Periode 1	6.0	X_405082

<a href="#">Memory and Memory Disorders</a>	Periode 2	6.0	P_MMEMORY
<a href="#">Mini-Master Project AI</a>	Ac. Jaar (september)	6.0	X_400428
<a href="#">Review Paper</a>	Ac. Jaar (september)	6.0	P_MREVPAP
<a href="#">Seminar Attention</a>	Periode 5	6.0	P_MSEMATT

## Compulsory Courses

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
<a href="#">Brain Imaging</a>	Periode 1, Periode 2+3	6.0	P_MBRIMAG
<a href="#">Evolutionary Computing</a>	Periode 1	6.0	X_400111
<a href="#">Knowledge Engineering</a>	Periode 2+3	6.0	X_405099
<a href="#">Model-based Intelligent Environments</a>	Periode 1	6.0	X_405056
<a href="#">Research Methods</a>	Periode 2	6.0	X_405085
<a href="#">Seminar Cognitive Neuroscience</a>	Periode 2	6.0	P_MSEMCNS
<a href="#">Thinking and Deciding</a>	Periode 2	6.0	P_MTHIDEC

## Constrained Choice

Vakken:

Naam	Periode	Credits	Code
<a href="#">Master Project</a>	Ac. Jaar (september)	30.0	X_400285
<a href="#">Master Thesis: Research Project Cognitive Science</a>	Ac. Jaar (september)	30.0	P_MTHRCSC

## Research Variant Human Ambience

In the Master variant Human Ambience you learn on a detailed level how to model both mental and physiological processes of human functioning. For instance, you can learn how to model the mental and physical states associated with depression. Such models are then used in applications that support humans in their daily lives in a dedicated manner, also to enable the developed support systems to understand humans better. In the specialization phase of the master you can study relevant courses with respect to an application area (e.g. support of people during exercising, or elderly care) or a relevant scientific discipline (e.g. psychology, sociology, movement sciences, biomedical sciences, criminology, etc.). During your final Master project you will then combine your domain knowledge with the knowledge of modeling such human processes.

The programme consists of 120 credits

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

Opleidingsdelen:

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

## Optional courses

N.B. Students can compose an individual programme by selecting all optional courses from one specific discipline, but also by combining courses from different disciplines, which have a common application.

Opleidingsdelen:

- [Optional courses Health](#)
- [Optional courses Mental Functioning/Health](#)
- [Optional courses Movement](#)
- [Optional courses Criminology](#)
- [Optional courses Safety/Networks/Policy](#)

Vakken:

Naam	Periode	Credits	Code
<a href="#">Advanced Information Retrieval</a>	Periode 4	6.0	X_418043
<a href="#">Advanced Logic</a>	Periode 4	6.0	X_405048
<a href="#">Data Mining Techniques</a>	Periode 5	6.0	X_400108
<a href="#">ICT4D: Information and communication technology for Development</a>	Periode 5	6.0	X_405101
<a href="#">Intelligent Web Applications</a>	Periode 4	6.0	X_405055
<a href="#">Knowledge and Media</a>	Periode 1	6.0	X_405065
<a href="#">Mini-Master Project AI</a>	Ac. Jaar (september)	6.0	X_400428

## Optional courses Health

Vakken:

Naam	Periode	Credits	Code
<a href="#">Health Promotion and Disease Prevention</a>	Periode 1	6.0	AM_470811
<a href="#">Health Psychology</a>	Periode 2	6.0	AM_470730

<a href="#">Prevention of Mental Health Problems</a>	Periode 3	6.0	AM_470840
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## Optional courses Mental Functioning/Health

Vakken:

Naam	Periode	Credits	Code
<a href="#">Advanced Data Analysis</a>	Periode 4	6.0	P_MADV DAT
<a href="#">Aging and Dementia</a>	Periode 1, Periode 3	6.0	P_MAGINGD
<a href="#">Brain Imaging</a>	Periode 1, Periode 2+3	6.0	P_MBRIMAG
<a href="#">Memory and Memory Disorders</a>	Periode 2	6.0	P_MMEMORY
<a href="#">Neuropsychology of Cognitive Dysfunctioning</a>		6.0	P_MNCDYSF
<a href="#">Seminar Attention</a>	Periode 5	6.0	P_MSEMATT
<a href="#">Seminar Cognitive Neuroscience</a>	Periode 2	6.0	P_MSEMCNS
<a href="#">Thinking and Deciding</a>	Periode 2	6.0	P_MTHIDEC

## Optional courses Movement

Vakken:

Naam	Periode	Credits	Code
<a href="#">Coordination Dynamics: Prin. Clin. Appl.</a>	Periode 2	6.0	B_CLINCORDYN
<a href="#">Dynamica van Lineaire Systemen</a>	Periode 1	3.0	B_DYNAMICA
<a href="#">Energy Flow Models</a>	Periode 1	3.0	B_ENERFLOW
<a href="#">Perception for Action</a>	Periode 4	3.0	B_PERCACTION

## Optional courses Criminology

Vakken:

Naam	Periode	Credits	Code
<a href="#">Misdaadanalyse en daderprofilering</a>	Periode 2	6.0	R_Misd.anaC
<a href="#">Spatial Criminology</a>	Periode 5	6.0	R_SpaCrim

## Optional courses Safety/Networks/Policy



Vakken:

Naam	Periode	Credits	Code
Beleid en management	Periode 1	6.0	S_BLM
Fysieke veiligheid en crisisbeheersing	Periode 4	6.0	S_FVC
Governance of Security and Policing	Periode 2	6.0	S_GSP
Networked Organizations and Communication	Periode 2	6.0	S_NOC
Ondernemerschap en innovatie, een relationeel perspectief	Periode 2	6.0	S_OIRP
Veiligheid en burgerschap	Periode 2	6.0	S_VB

## Recommended elective Courses

Vakken:

Naam	Periode	Credits	Code
History of digital cultures	Periode 3	6.0	X_418107
Intelligent Interactive Systems	Periode 1	6.0	X_418023
Multimedia Information Systems	Periode 2	6.0	X_418070
Psychology of Effective Gaming	Periode 1	6.0	X_418145
Serious Games	Periode 5	6.0	X_405097
Technology for Games	Periode 2	6.0	X_418146
The Social Web	Periode 4	6.0	X_405086

## Compulsory Courses

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
Behaviour Dynamics	Periode 2	6.0	X_400113
Comparative Modeling	Periode 6	6.0	X_405091
Evolutionary Computing	Periode 1	6.0	X_400111
Experimental Design and Data Analysis	Periode 5	6.0	X_405078
Knowledge Engineering	Periode 2+3	6.0	X_405099

<a href="#">Master Project</a>	Ac. Jaar (september)	30.0	X_400285
<a href="#">Model-based Intelligent Environments</a>	Periode 1	6.0	X_405056
<a href="#">Research Methods</a>	Periode 2	6.0	X_405085

## Research variant Data Science

This specialization focuses on understanding, analyzing and working with large amounts of data. Students study the entire Data Science lifecycle from data acquisition and management to analysis and visualization. These techniques include machine learning and data mining, large scale data management, information visualization and reasoning over web data. There is a strong emphasis on applying artificial intelligence techniques to Data Science problems and in particular setting up experiments and performing informative analyses. Students will have the opportunity to apply their knowledge to large real world datasets like those from social media or the web. During the final Masters project, students will put together all facets of their education to tackle a data science problem.

The programme consists of 120 credits

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

Opleidingsdelen:

- [Data Analysis](#)
- [Data Management](#)
- [Optional Courses](#)
- [Compulsory Courses](#)

## Data Analysis

Compulsory 12 ec

Vakken:

Naam	Periode	Credits	Code
<a href="#">Advanced Information Retrieval</a>	Periode 4	6.0	X_418043
<a href="#">Applied Language Technology</a>	Periode 1	6.0	X_405120
<a href="#">Automated Reasoning in AI</a>	Periode 5	6.0	X_400389
<a href="#">Data Mining Techniques</a>	Periode 5	6.0	X_400108

## Data Management

Compulsory 12 ec

Vakken:

Naam	Periode	Credits	Code
<a href="#">Distributed Systems</a>	Periode 2	6.0	X_400130
<a href="#">Intelligent Web Applications</a>	Periode 4	6.0	X_405055
<a href="#">Knowledge and Media</a>	Periode 1	6.0	X_405065
<a href="#">The Social Web</a>	Periode 4	6.0	X_405086

## Optional Courses

Vakken:

Naam	Periode	Credits	Code
<a href="#">Advanced Logic</a>	Periode 4	6.0	X_405048
<a href="#">Advanced Selforganisation</a>	Periode 2	6.0	X_400434
<a href="#">Behaviour Dynamics</a>	Periode 2	6.0	X_400113
<a href="#">Coding and Cryptography</a>	Periode 1	6.0	X_405041
<a href="#">Comparative Modeling</a>	Periode 6	6.0	X_405091
<a href="#">Concurrency and Multithreading</a>	Periode 1	6.0	X_405064
<a href="#">Distributed Algorithms</a>	Periode 2	6.0	X_400211
<a href="#">History of digital cultures</a>	Periode 3	6.0	X_418107
<a href="#">ICT4D: Information and communication technology for Development</a>	Periode 5	6.0	X_405101
<a href="#">Internet programming</a>	Periode 1	6.0	X_405082
<a href="#">Logical Verification</a>	Periode 5	6.0	X_400115
<a href="#">Mini-Master Project AI</a>	Ac. Jaar (september)	6.0	X_400428
<a href="#">Mobile Systems</a>	Periode 4	6.0	X_418068
<a href="#">Neurale Netwerken</a>	Periode 1	6.0	X_400132
<a href="#">Operating Systems</a>	Periode 5	6.0	X_405067
<a href="#">Parallel Programming for High-performance Applications</a>	Periode 1	6.0	X_400161
<a href="#">Service Oriented Design</a>	Periode 1	6.0	X_405061
<a href="#">Software Architectuur</a>	Periode 2	6.0	X_400170
<a href="#">Software Testing</a>	Periode 5	6.0	X_400439

## Compulsory Courses

Vakken:

Naam	Periode	Credits	Code
<a href="#">Evolutionary Computing</a>	Periode 1	6.0	X_400111
<a href="#">Experimental Design and Data Analysis</a>	Periode 5	6.0	X_405078

<a href="#">Information Visualization</a>	Periode 4	6.0	X_418143
<a href="#">Knowledge Engineering</a>	Periode 2+3	6.0	X_405099
<a href="#">Large Scale Data Engineering</a>	Periode 4	6.0	X_405116
<a href="#">Machine Learning: Pattern Recognition</a>	Periode 1	6.0	X_418144
<a href="#">Master Project</a>	Ac. Jaar (september)	30.0	X_400285
<a href="#">Model-based Intelligent Environments</a>	Periode 1	6.0	X_405056
<a href="#">Research Methods</a>	Periode 2	6.0	X_405085

## Research variant Intelligent Systems

This specialisation combines the 'bottom-up' and 'top-down' design approaches to systems that perceive, reason, learn and act intelligently. Students study the architecture, components, modules, representations and interfaces of intelligent systems. Students combine courses in declarative formal representations with strongly algorithmic approaches. There is a strong emphasis on experimentation.

The intelligent systems considered vary from adaptive and collective systems to 'symbol-systems'. The adaptive systems often use algorithms based on inspiration from nature such as evolutionary algorithms and self-organisation. The 'symbol-systems' are typically based on various forms of logic, structured representations of knowledge and reasoning by symbol-manipulation.

The programme consists of 120 credits

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

Opleidingsdelen:

- [Constrained choice \(12 EC\)](#)
- [Optional Courses](#)
- [Compulsory Courses](#)

### Constrained choice (12 EC)

Vakken:

Naam	Periode	Credits	Code
<a href="#">Advanced Information Retrieval</a>	Periode 4	6.0	X_418043
<a href="#">Automated Reasoning in AI</a>	Periode 5	6.0	X_400389
<a href="#">Experimental Design and Data Analysis</a>	Periode 5	6.0	X_405078
<a href="#">Neurale Netwerken</a>	Periode 1	6.0	X_400132
<a href="#">The Social Web</a>	Periode 4	6.0	X_405086

## Optional Courses

Vakken:

Naam	Periode	Credits	Code
<a href="#">Advanced Logic</a>	Periode 4	6.0	X_405048
<a href="#">Behaviour Dynamics</a>	Periode 2	6.0	X_400113
<a href="#">Comparative Modeling</a>	Periode 6	6.0	X_405091
<a href="#">Distributed Algorithms</a>	Periode 2	6.0	X_400211
<a href="#">Distributed Systems</a>	Periode 2	6.0	X_400130
<a href="#">History of digital cultures</a>	Periode 3	6.0	X_418107
<a href="#">ICT4D: Information and communication technology for Development</a>	Periode 5	6.0	X_405101
<a href="#">Knowledge and Media</a>	Periode 1	6.0	X_405065
<a href="#">Large Scale Data Engineering</a>	Periode 4	6.0	X_405116
<a href="#">Mini-Master Project AI</a>	Ac. Jaar (september)	6.0	X_400428
<a href="#">Operating Systems</a>	Periode 5	6.0	X_405067

## Compulsory Courses

Vakken:

Naam	Periode	Credits	Code
<a href="#">Advanced Selforganisation</a>	Periode 2	6.0	X_400434
<a href="#">Data Mining Techniques</a>	Periode 5	6.0	X_400108
<a href="#">Evolutionary Computing</a>	Periode 1	6.0	X_400111
<a href="#">Intelligent Web Applications</a>	Periode 4	6.0	X_405055
<a href="#">Knowledge Engineering</a>	Periode 2+3	6.0	X_405099
<a href="#">Master Project</a>	Ac. Jaar (september)	30.0	X_400285
<a href="#">Model-based Intelligent Environments</a>	Periode 1	6.0	X_405056
<a href="#">Research Methods</a>	Periode 2	6.0	X_405085

## Advanced Data Analysis

<b>Vakcode</b>	P_MADV DAT (815033)
<b>Periode</b>	Periode 4
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Psychologie en Pedagogiek
<b>Coördinator</b>	dr. M. Gallucci

<b>Examinator</b>	dr. M. Gallucci
<b>Docent(en)</b>	dr. M. Gallucci
<b>Lesmethode(n)</b>	Hoorcollege
<b>Niveau</b>	400

### Doel vak

This course provides a theoretical overview and detailed practical knowledge concerning statistical analyses of social psychological data.

### Inhoud vak

After an introduction of the general linear model, with emphasis on estimation of effect sizes and hypothesis testing, the course concentrates on applications of the model, such as analysis of variance, regression analysis, path analysis, and logistic regression. Along with these techniques, issues such as mediation, moderation, and hypothesis testing are considered. The aim of the course is to enable students to plan, execute, and interpret appropriate statistical analyses for applied and experimental research data. Because the application of advanced statistical techniques is central to the course, students will have several assignments to analyze existing data sets, and interpret the results.

### Onderwijsvorm

Lectures and tutorials.

### Toetsvorm

Exams and assignments.

### Literatuur

- Cohen, J., Cohen, P., West, S.G., & Aiken, L.S. (2003), Applied Multiple regression / correlation; analysis for the behavioural sciences (3rd ed. ) Hillsdale, NJ: Erlbaum
- Additional material provided during the course.

## Advanced Information Retrieval

<b>Vakcode</b>	X_418043 (418043)
<b>Periode</b>	Periode 4
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Niveau</b>	500

### Inhoud vak

The course description is available on:

<http://studiegids.uva.nl/xmlpages/page/2014-2015/zoek-vak/vak/742811>

### Overige informatie

Registration is required via <https://www.sis.uva.nl> until four weeks before the start of the semester.

## Advanced Logic

<b>Vakcode</b>	X_405048 (405048)
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<b>Periode</b>	Periode 4
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	dr. R.D.A. Hendriks
<b>Examinator</b>	dr. R.D.A. Hendriks
<b>Docent(en)</b>	dr. R.D.A. Hendriks
<b>Lesmethode(n)</b>	Hoorcollege, Werkcollege
<b>Niveau</b>	500

### Doel vak

The objective is to obtain a good understanding of modal logic and its use in computer science and artificial intelligence.

### Inhoud vak

A thorough introduction to modal logics, and its applications in computer science and artificial intelligence. We will select some themes from the book *Modal Logics for Open Minds*, by Johan van Benthem: basic modal logic and possible world semantics, bisimulation and invariance, modal definability, decidability, ... In particular we treat the modal logics most relevant to computer science and AI: temporal, dynamic and epistemic logic.

### Onderwijsvorm

Weekly 2 lectures and 1 exercise class, for the duration of 7 weeks.

### Toetsvorm

A written exam and assignments that can make half a point bonus.

### Literatuur

Johan van Benthem, *Modal Logics for Open Minds*, CSLI Publications 2010.

### Aanbevolen voorkennis

The bachelor course *Logica en Modelleren* (previously *Inleiding Logica*), or an equivalent introduction to first-order logic.

### Doelgroep

mAI, mCS, mPDCS

## Advanced Selforganisation

<b>Vakcode</b>	X_400434 (400434)
<b>Periode</b>	Periode 2
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	dr. M.C. Schut
<b>Examinator</b>	dr. M.C. Schut
<b>Docent(en)</b>	dr. M.C. Schut
<b>Lesmethode(n)</b>	Hoorcollege
<b>Niveau</b>	400

### Doel vak

To understand, simulate and analyse the behaviour and self-organization of complex systems. The student is able to explain, implement and recognize basic principles and properties of such systems.

### Inhoud vak

This course is about the understanding of the behavior and self-organization of complex systems: systems in which the interaction of the components is not simply reducible to the properties of the components. The general question we address is: how should systems of very many independent computational (e.g. robotic or software) agents cooperate in order to process information and achieve their goals, in a way that is efficient, self-optimizing, adaptive, and robust in the face of damage or attack? We will look at natural systems that solve some of the same problems that we want to solve, e.g. adaptive path minimization by ants, wasp and termite nest building, army ant raiding, fish schooling and bird flocking, coordinated cooperation in slime molds, synchronized firefly flashing, evolution by natural selection, game theory and the evolution of cooperation. The course includes a practical part in which students implement a simulation of a self-organizing complex system and conduct structured experimental analysis with this simulation.

### Onderwijsvorm

Theory in lectures and practice in labs.

### Toetsvorm

Report including description of simulation and experimental analysis.

### Literatuur

Schut M.C., Scientific Handbook for Simulation of Collective Intelligence, 2007. Will be distributed in class.

### Doelgroep

mAI, mBA, mCS, mPDCS

### Overige informatie

More information available on BlackBoard. This is a project-oriented course and therefore students will be expected to have basic programming skills.

## Aging and Dementia

<b>Vakcode</b>	P_MAGINGD (815181)
<b>Periode</b>	Periode 1, Periode 3
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Psychologie en Pedagogiek
<b>Coördinator</b>	prof. dr. E.J.A. Scherder
<b>Examinator</b>	prof. dr. E.J.A. Scherder
<b>Docent(en)</b>	prof. dr. E.J.A. Scherder
<b>Lesmethode(n)</b>	Hoorcollege
<b>Niveau</b>	400



**Doel vak**

Provide an advanced course on the neuropathological, cognitive and behavioural consequences of aging and age-related neurodegenerative diseases, in particular dementia.

**Inhoud vak**

The neuropathology characteristic for aging and various subtypes of dementia will be related to specific functional neuronal circuits. Based on these functional neuronal circuits the clinical outcome in terms of cognitive and behavioural disorders will be explained. Specific attention will be given to the relationship between dementia and motor activity and between dementia and pain experience.

**Onderwijsvorm**

Plenary lectures, with an emphasis on interaction with the students.

**Toetsvorm**

Open-end questions.

**Literatuur**

E. Scherder. Aging and Dementia. Neuropsychology, motor skills and pain. VU Uitgeverij.

## Applied Language Technology

<b>Vakcode</b>	X_405120 ()
<b>Periode</b>	Periode 1
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Docent(en)</b>	dr. H.D. van der Vliet
<b>Lesmethode(n)</b>	Hoorcollege

**Inhoud vak**

<http://studiegids.uva.nl/xmlpages/page/2014-2015/zoek-vak/vak/740080>

**Overige informatie**

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

## Automated Reasoning in AI

<b>Vakcode</b>	X_400389 (400389)
<b>Periode</b>	Periode 5
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	prof. dr. F.A.H. van Harmelen
<b>Examinator</b>	prof. dr. F.A.H. van Harmelen
<b>Docent(en)</b>	prof. dr. F.A.H. van Harmelen
<b>Lesmethode(n)</b>	Hoorcollege

<b>Niveau</b>	500
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### Doel vak

Since its early days Artificial Intelligence has employed logic as a mean to provide generic solutions for computationally and conceptually difficult practical problems.

The aim of the course is to make the students familiar with a number of popular logic- based representation and reasoning mechanisms for Artificial Intelligence. Furthermore, students should have the capability to transfer the learned techniques to other problems and to other representation mechanisms.

### Inhoud vak

The course will be structured in three modules. In each of these modules a practical problem will be introduced, a logic- based representation proposed, and the basic techniques for automated reasoning in this language studied in a practical, hands on, way.

In a nutshell, we plan to cover:

- propositional Logic for scheduling, and satisfiability checking with Davis Putnam;
- Allen's interval logic for Planning, with constraint propagation in Temporal Constraint Networks;
- description logics for classification, with Tableau calculi for subsumption.

### Onderwijsvorm

There will be lectures and practical sessions, plus significant time for self- study and practical work.

### Toetsvorm

3 practical assignments

### Literatuur

Selected scientific papers.

### Vereiste voorkennis

Basic knowledge in logic is an advantage, but not required, as is some familiarity with programming.

### Doelgroep

mAI

### Overige informatie

For further information see the AR in AI blackboard site.

## Behaviour Dynamics

<b>Vakcode</b>	X_400113 (400113)
<b>Periode</b>	Periode 2
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	prof. dr. J. Treur
<b>Examinator</b>	prof. dr. J. Treur
<b>Docent(en)</b>	prof. dr. J. Treur

<b>Lesmethode(n)</b>	Hoorcollege, Practicum
<b>Niveau</b>	400

### Doel vak

To learn how to identify, specify and predict different types of behaviour of single agents and agents in groups and social networks ; to understand how externally observable behaviour emerges from internal mechanisms, and how group behaviour emerges from single agent behaviour; to be able to construct computational behavioural models and to perform analysis based on these models using software tools and empirical data.

### Inhoud vak

Behavioural dynamics in social networks occurs in different forms, contexts and complexity. During the course examples of such behaviour in social networks are studied. The dynamics of such behaviour is analysed (including verification and validation), modelled and simulated in this course using different techniques and tools.

### Onderwijsvorm

Combinations of lectures and practical assignments.

### Toetsvorm

Practical assignments.

### Literatuur

Online reader.

### Vereiste voorkennis

Knowledge in mathematical logics (in particular, first-order predicate logic), logic programming

### Aanbevolen voorkennis

Somer background in modelling and logical formalisms.

### Doelgroep

mAI

## Beleid en management

<b>Vakcode</b>	S_BLM ()
<b>Periode</b>	Periode 1
<b>Credits</b>	6.0
<b>Voertaal</b>	Nederlands
<b>Faculteit</b>	Faculteit der Sociale Wetenschappen
<b>Coördinator</b>	dr. D.B.D. Bannink
<b>Examinator</b>	dr. D.B.D. Bannink
<b>Docent(en)</b>	dr. mr. A.J.G.M. van Montfort, dr. D.B.D. Bannink
<b>Lesmethode(n)</b>	Hoorcollege, Werkgroep

### Doel vak

- Het beschikken over kennis van recente benaderingen, inzichten en theorieën over de ontwikkeling, het management en de implementatie van

publiek beleid, mede gelet op de toenemende complexiteit van a) moderne samenlevingsvraagstukken en b) de institutionele vormgeving van het bestuur, waaronder begrepen de verdeling van taken en verantwoordelijkheden tussen publieke, semi-publieke en private actoren.

- Het beschikken over een onafhankelijke opstelling en een vermogen tot kritische reflectie ten opzichte van deze benaderingen, inzichten en theorieën.
- Het kunnen toepassen van deze benaderingen, inzichten en theorieën op concrete vraagstukken van beleid en management in de publieke sector, dit met het oog op zowel de analyse als de vormgeving van beleid.

### Inhoud vak

Beleids maken, het is gemakkelijk gezegd, maar in onze complexe samenleving bepaald geen sinecure. De maatschappelijke vraagstukken zijn verre van inzichtelijk, en gewoonlijk zijn bij het beleidsprobleem ook nog eens veel verschillende stakeholders betrokken, ieder met hun eigen waarden, belangen en gezichtspunten. Ondertussen vragen veeleisende burgers wel om tastbare beleidsprestaties. Daarnaast is het steeds meer de vraag of beleidsinterventies nog wel kans van slagen hebben in een wereld die minder 'maakbaar' lijkt geworden: wat mogen we tegenwoordig eigenlijk nog verwachten van het overheidsbeleid? Mede met het oog op die vraag, zijn het management en de uitvoering van beleid steeds meer een puzzel geworden: om tot succes te komen, worden steeds meer partijen in de beleidsketen betrokken, waaronder ook private ondernemingen en maatschappelijke organisaties. Dit kan nuttig zijn, maar het compliceert het management en de beleidsuitvoering ook. Tegen deze achtergrond draait het in dit masterseminar om de volgende vragen: wat leren moderne wetenschappelijke inzichten ons a) over de maakbaarheid van beleid, (oorzaken van beleidsstagnatie; mogelijkheden van beleidsvernieuwing) en b) over de mogelijkheden om beleid uit te voeren in complexe en 'hybride' institutionele structuren (beleidsnetwerken, marktwerking, en dergelijke). Gedurende het seminar zal de aandacht worden gericht op specifieke beleidssectoren.

### Toetsvorm

Schriftelijke opdracht

### Literatuur

- Nader op te geven c.q. te verstrekken literatuur en beleidsdocumenten.

### Doelgroep

Masterstudenten Bestuurskunde

## Brain Imaging

<b>Vakcode</b>	P_MBRIMAG (815103)
<b>Periode</b>	Periode 1, Periode 2+3
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Psychologie en Pedagogiek
<b>Coördinator</b>	dr. D.J. Heslenfeld
<b>Examinator</b>	dr. D.J. Heslenfeld
<b>Docent(en)</b>	dr. D.J. Heslenfeld
<b>Lesmethode(n)</b>	Hoorcollege
<b>Niveau</b>	400

**Doel vak**

The course will treat physical principles, recording apparatus, and practical applications of the four major brain imaging techniques: EEG, MEG, MRI, PET, with an emphasis on EEG and MRI. These techniques will be discussed in detail and live demonstrated. We will visit the various labs, and students will participate in a small research project. This includes recording and analyzing brain imaging data in small supervised groups.

**Inhoud vak**

The course will treat physical principles, recording apparatus, and practical applications of the four major brain imaging techniques: EEG, MEG, MRI, PET, with an emphasis on EEG and MRI. These techniques will be discussed in detail and live demonstrated. We will visit the various labs, and students will perform a small research project of their own. This includes recording and analyzing your own brain imaging data in small supervised groups.

**Onderwijsvorm**

Lectures and obligatory practicals.

**Toetsvorm**

Written examination

**Literatuur**

- Luck, S (2005) An introduction to the Event -Related Potential Technique Cambridge, MA: MIT Press
- Huettel, S et al (2009) Functional Magnetic Resonance Imaging; (2 nd. ed. ) Sunderland, MA: Sinauer;

**Coding and Cryptography**

<b>Vakcode</b>	X_405041 (405041)
<b>Periode</b>	Periode 1
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	prof. dr. R.M.H. de Jeu
<b>Examinator</b>	prof. dr. R.M.H. de Jeu
<b>Docent(en)</b>	prof. dr. R.M.H. de Jeu
<b>Lesmethode(n)</b>	Hoorcollege
<b>Niveau</b>	500

**Doel vak**

To give an introduction the theory of error correcting codes and to cryptography.

**Inhoud vak**

This course provides a thorough introduction to the theory of error correcting codes, and to cryptography. It is aimed especially at students of Computer Science. For error correcting codes we shall include cyclic codes, BCH codes, Reed-Solomon codes and burst error correction. For cryptography we discuss some modern public key

cryptography (e.g., RSA, ElGamal, DSA).

### Onderwijsvorm

Lectures and exercise classes

### Toetsvorm

Written exam and homework

### Literatuur

We shall be working from "Coding theory and cryptography, the essentials" by Hankerson, Hoffman, Leonard, Lindner, Phelps, Rodger and Wall (second edition, revised and expanded).

### Aanbevolen voorkennis

Some knowledge on linear algebra, on the integers modulo  $n$ , and on polynomials.

### Doelgroep

mAI, mCS, mMath, mPDCS

## Comparative Modeling

<b>Vakcode</b>	X_405091 ()
<b>Periode</b>	Periode 6
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	dr. T. Bosse
<b>Examinator</b>	dr. T. Bosse
<b>Docent(en)</b>	dr. T. Bosse
<b>Lesmethode(n)</b>	Hoorcollege, Practicum

### Doel vak

At the end of the course, you will:

- be able to understand the 3D classification scheme for conceptualisation of computational models of human processes (including the process abstraction, temporal, and agent cluster dimension)
- be able to classify computational models according to this scheme
- be able to develop computational models at different points in the classification scheme (via various techniques)
- be able to relate two models at different levels of one dimension to each other (via various techniques)
- understand how qualitative and quantitative aspects can play a role within models at different points in the scheme
- understand how domain models at different points in the scheme can be integrated within agent models
- be more experienced in developing computational models
- be acquainted with the modelling languages TTL and Matlab, and their software environments.

### Inhoud vak

This course provides an overview of different types of computational models of human processes, and shows how they can be related to each other. In particular, the course shows how such models can be classified according to three dimensions: the process abstraction dimension, the

temporal dimension, and the clustering dimension. In addition, interlevel relations between different models in the classification scheme are addressed. These topics are illustrated by means of examples from biomedical, psychological, and social disciplines, and are applied in assignments where models are developed for relevant applications within Ambient Intelligence.

#### **Onderwijsvorm**

Lectures, seminars, and lab sessions.

#### **Toetsvorm**

Lab assignments and exam

#### **Literatuur**

Online syllabus

#### **Doelgroep**

mAI

#### **Overige informatie**

Basic knowledge of (agent-based) computational modeling is recommended

## Concurrency and Multithreading

<b>Vakcode</b>	X_405064 (405064)
<b>Periode</b>	Periode 1
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	prof. dr. W.J. Fokkink
<b>Examinator</b>	prof. dr. W.J. Fokkink
<b>Docent(en)</b>	prof. dr. W.J. Fokkink
<b>Lesmethode(n)</b>	Hoorcollege, Werkcollege
<b>Niveau</b>	400

#### **Doel vak**

This course provides a comprehensive presentation of the foundations and programming principles for multicore machines.

#### **Inhoud vak**

Shared memory, mutual exclusion, synchronization operations, concurrent data structures, scheduling, transactional memory, multithreaded programming.

#### **Onderwijsvorm**

Lectures: 4 hours per week, exercise classes: 4 hours per week.

#### **Toetsvorm**

Written exam (which counts for 70% of the final mark) and one programming assignment (which counts for 30% of the final mark).

#### **Literatuur**

Maurice Herlihy, Nir Shavit, The Art of Multiprocessor Programming, Morgan Kaufmann, 2008.

## Doelgroep

mAI, mCS, mPDCS

## Overige informatie

The homepage of the course is at <http://www.cs.vu.nl/~tcs/cm/>

The lectures and written exam of the BSc and MSc variant of Concurrency and Multithreading coincide. The difference is that the BSc variant has a smaller programming assignment than the MSc variant.

The MSc variant of this course cannot be followed by students that included the BSc variant in their BSc program.

## Coordination Dynamics: Prin. Clin. Appl.

<b>Vakcode</b>	B_CLINCORDYN (900666)
<b>Periode</b>	Periode 2
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Bewegingswetenschappen
<b>Coördinator</b>	dr. M. Roerdink
<b>Examinator</b>	dr. M. Roerdink
<b>Docent(en)</b>	dr. M. Roerdink
<b>Lesmethode(n)</b>	Hoorcollege, Computerpracticum, Practicum, Bijeenkomst, Deeltoets extra zaalcapaciteit
<b>Niveau</b>	400

## Doel vak

The coordination dynamics approach is pursued to study how patterns of coordinated movement come about, persist and change as a function task constraints, expertise and pathology. The student is acquainted with the key principles, concepts and methods of coordination dynamics. The student can explain these aspects in a qualitative manner. The student is able to indicate how these aspects may contribute to assessments and interventions in the context of sports and rehabilitation. The student can interpret scientific literature in the area of coordination dynamics. The student can design new basic or applied coordination dynamics experiments.

## Inhoud vak

Coordination dynamics is governed on the one hand by principles of self-organization, and on the other hand by intentionality, perceptual information and explicit knowledge. Coordination patterns exist at multiple levels: 1. dynamics within or between body segments of a moving person; 2. dynamics between moving segments of multiple persons and 3. dynamics between person and external events, as well as between persons. Coordination dynamics provides a framework to study the nature of pathological, normal and expert movements by assessing stability and loss of stability of coordination patterns as a function of training and rehabilitation.

The first part of the course provides an overview of the key principles, concepts and methods of coordination dynamics by adopting a 3-stage empirical approach: 1. gaining background theoretical information through lectures and literature, 2. gaining hands-one experience by



participating in experiments, formulating hypotheses and analyzing the so-obtained data, 3. gaining a thorough understanding of the key aspects of coordination dynamics by linking theory and practice.

The second part of the course focuses on the application of coordination dynamics in sports and rehabilitation, again by adopting a 3-stage empirical approach. In the context of rehabilitation, specific emphasis will be placed on interventions based on environmental coupling aimed at facilitating desired coordination patterns and/or stabilizing existing unstable coordination patterns. In the context of sports, the nature of interactions between two or more athletes will be the focal point, including their cooperative and competitive effects on pattern formation and coordinative stability.

### Onderwijsvorm

Amount of contact hours (36 hrs), divided in:

Lectures: 10 \* 1.75 hrs

Laboratories: 2 \* 2.00 hrs

Computer Practicals: 5 \* 2.00 hrs

Midterm Exam: 1 \* 1.75 hrs

Exam: 2.75 hrs

Self study: 132 hrs

### Toetsvorm

Written closed-book exams with open-ended questions. The final grade is determined by both the Midterm Exam (25%) and the Final Exam (75%). However, in case the grade of the Midterm Exam is lower than that of the Final Exam, the final grade is fully determined by the Final Exam grade (i.e., Midterm Exam [0%], Final Exam [100%]).

### Literatuur

A selection of relevant book chapters and articles.

### Vereiste voorkennis

Basic understanding of statistics (What is a standard deviation?), sine waves (What is the amplitude, offset, frequency and phase?), integral and differential calculus (What is the derivative of a sine wave?) and Matlab (Can you run a script?). Please note that Matlab scripts and functions are provided and so programming skills are not required for the computer practicals. Computer practicals are included to become acquainted with the handling and interpretation of the experimental data and associated coordination dynamics outcome measures).

### Overige informatie

Note that Laboratory 2 will be held at the Duyvensz-Nagel Research Laboratory of Reade Center for Rehabilitation and Rheumatology (DNO, Reade, Overtoom 283). Students can subscribe for Laboratories and Computer Practicals on BlackBoard.

## Data Mining Techniques

<b>Vakcode</b>	X_400108 (400108)
<b>Periode</b>	Periode 5
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen

<b>Coördinator</b>	dr. M. Hoogendoorn
<b>Examinator</b>	dr. M. Hoogendoorn
<b>Docent(en)</b>	dr. M. Hoogendoorn
<b>Lesmethode(n)</b>	Hoorcollege
<b>Niveau</b>	500

### **Doel vak**

The aim of the course is that students acquire data mining knowledge and skills that they can apply in a business environment. How the aims are to be achieved: Students will acquire knowledge and skills mainly through the following: an overview of the most common data mining algorithms and techniques (in lectures), a survey of typical and interesting data mining applications, and practical assignments to gain "hands on" experience. The application of skills in a business environment will be simulated through various assignments of the course.

### **Inhoud vak**

The course will provide a survey of basic data mining techniques and their applications for solving real life problems. After a general introduction to Data Mining we will discuss some "classical" algorithms like Naive Bayes, Decision Trees, Association Rules, etc., and some recently discovered methods such as boosting, Support Vector Machines, and co-learning. A number of successful applications of data mining will also be discussed: marketing, fraud detection, text and Web mining, possibly bioinformatics. In addition to lectures, there will be an extensive practical part, where students will experiment with various data mining algorithms and data sets. The grade for the course will be based on these practical assignments (i.e., there will be no final examination).

### **Onderwijsvorm**

Lectures and compulsory practical work. Lectures are planned to be interactive: there will be small questions, one-minute discussions, etc.

### **Toetsvorm**

Practical assignments (i.e. there is no exam). There will be two assignments done in groups of three. There is a possibility to get a grade without doing these assignments: to do a real research project instead (which will most likely to involve more work, but it can also be more rewarding).

### **Literatuur**

Ian H. Witten, Eibe Frank, Mark A. Hall, Data Mining: Practical Machine Learning Tools and Techniques (Third Edition). Morgan Kaufmann, January 2011  
ISBN 978-0-12-374856-0

### **Aanbevolen voorkennis**

Kansrekening en Statistiek of Algemene Statistiek (knowledge of statistics and probabilities) or equivalent. Recommended: Machine Learning.

### **Doelgroep**

mBA, mCS, mAI, mBio

## **Distributed Algorithms**

<b>Vakcode</b>	X_400211 (400211)
<b>Periode</b>	Periode 2
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	prof. dr. W.J. Fokkink
<b>Examinator</b>	prof. dr. W.J. Fokkink
<b>Docent(en)</b>	prof. dr. W.J. Fokkink
<b>Lesmethode(n)</b>	Hoorcollege, Werkcollege
<b>Niveau</b>	500

### Doel vak

To obtain a good understanding of concurrency concepts and a large range of distributed algorithms.

### Inhoud vak

Snapshots, graph traversal, termination detection, garbage collection, deadlock detection, routing, election, minimal spanning trees, anonymous networks, fault tolerance, failure detection, synchronization, consensus, mutual exclusion, self-stabilization, on-line scheduling.

### Onderwijsvorm

4 hours per week HC  
4 hours per week WC

### Toetsvorm

Written examen (plus a take-home exercise sheet that can provide up to 0.5 bonus point).

### Literatuur

W.J Fokkink. Distributed Algorithms: An Intuitive Approach. MIT Press, 2013.

### Doelgroep

mAI, mCS, mPDCS

### Overige informatie

The homepage of the course is at <http://www.cs.vu.nl/~tcs/da/>

## Distributed Systems

<b>Vakcode</b>	X_400130 (400130)
<b>Periode</b>	Periode 2
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	dr. ing. T. Kielmann
<b>Examinator</b>	dr. ing. T. Kielmann
<b>Docent(en)</b>	dr. ing. T. Kielmann
<b>Lesmethode(n)</b>	Hoorcollege
<b>Niveau</b>	400

## **Doel vak**

After taking this course, students will be able to:

- understand to a large extent the intricacies related to designing and developing a distributed computer system.
- understand the tradeoffs between centralized, distributed, and fully decentralized solutions.
- be capable of successfully studying research papers on (advanced) distributed systems.

## **Inhoud vak**

It is difficult to imagine a standalone modern computer system: every such system is one way or the other connected through a communication network with other computer systems. A collection of networked computer systems is generally referred to as a distributed (computer) system. As with any computer system, we expect a distributed system to simply work, and often even behave as if it were a single computer system. In other words, we would generally like to see all the issues related to the fact that data, processes, and control are actually distributed across a network hidden behind well-defined and properly implemented interfaces. Unfortunately, life is not that easy.

As it turns out, distributed systems time and again exhibit emergent behavior that is difficult to understand by simply looking at individual components. In fact, many aspects of a distributed system cannot even be confined to a few components, as is easily seen by just considering security.

In this course, we pay attention to the pillars on which modern distributed systems are built. Unfortunately, these pillars cannot be viewed independently from each other: each one is equally important for understanding why a distributed system behaves the way it does, and depends on the way that other pillars have been constructed. In this sense, pillars form principles, in turn offering a view that one can take when studying distributed systems. We will consider the following principles:

- architectures
- processes
- communication
- naming
- coordination
- consistency and replication
- fault tolerance
- security

These principles will be discussed in the context of a few simplifying concepts that have been used to master the complexity of developing distributed systems: objects, files, documents, and events.

## **Onderwijsvorm**

The course is taught as a series of lectures.

## **Toetsvorm**

Written exam.

### Literatuur

This year, we will use a reader. Details about its distribution will be announced via blackboard in due time.

### Vereiste voorkennis

Students should have taken a standard course on computer networks. Experience with (distributed) programming will be helpful.

### Doelgroep

mCS, mPDCS, mAI, mIS

## Dynamica van Lineaire Systemen

<b>Vakcode</b>	B_DYNAMICA (900314)
<b>Periode</b>	Periode 1
<b>Credits</b>	3.0
<b>Voertaal</b>	Nederlands
<b>Faculteit</b>	Faculteit der Bewegingswetenschappen
<b>Coördinator</b>	dr. R.J. van Beers
<b>Examinator</b>	dr. R.J. van Beers
<b>Docent(en)</b>	dr. R.J. van Beers
<b>Lesmethode(n)</b>	Hoorcollege, Computerpracticum
<b>Niveau</b>	300

### Doel vak

Het gedrag van veel systemen in de bewegingswetenschappen, van biochemisch proces tot bewegingsapparaat, kan alleen worden beschreven in termen van differentiaalvergelijkingen. De theorie van lineaire dynamische systemen is een belangrijk hulpmiddel om het gedrag van deze systemen te begrijpen. Doel van de cursus is je bekend te maken met de beginselen van de theorie. Na het volgen van de cursus ben je in staat eenvoudige systemen te beschrijven in de vorm van een (gelineariseerde) differentiaalvergelijking of toestandsmodel, en het gedrag daarvan te interpreteren.

### Inhoud vak

Eerste- en tweede- orde systemen en tijdvertragingen worden besproken aan de hand van hun differentiaalvergelijkingen en hun standaard-responsies. Deze eenvoudige systemen geven een goed beeld van de essentie van het gedrag van lineaire dynamische systemen. Het toestandsmodel wordt geïntroduceerd als een algemene manier om dynamische systemen te beschrijven. Er worden methoden gepresenteerd om toestandsmodellen op te stellen, uit een differentiaalvergelijking dan wel door koppeling van deelsystemen, en deze te analyseren. In werkelijkheid zijn vrijwel alle dynamische systemen in meerdere of mindere mate niet- lineair toch is het vaak zinvol om ze lokaal bij benadering als lineair te beschouwen. In de cursus leer je hoe je systemen kunt lineariseren, en daarmee relevante informatie over het niet- lineaire systeem verkrijgt. Diverse voorbeelden uit de bewegingswetenschappen illustreren de stof.

### Onderwijsvorm

Hoorcolleges in combinatie met computerpractica en inleveropdrachten.

Urenverdeling:

16 uur hoor/responsiecollege;

24 uur voorbereiding colleges/practica;

21 uur computerpractica;

17 uur tentamenvoorbereiding;

2 uur tentamen.

### Toetsvorm

schriftelijk tentamen

Het eindcijfer wordt bepaald voor 90% bepaald door het cijfer voor het schriftelijk gesloten boek tentamen, en voor 10% door de beoordeling van inleveropdrachten. Dit zijn geselecteerde practicumopdrachten waarvan de uitwerking schriftelijk moet worden ingeleverd.

### Literatuur

Syllabus (interne publicatie).

### Overige informatie

Noodzakelijke voorkennis: In deze cursus wordt ervan uitgegaan dat de student de stof behandeld in de cursussen Wiskunde (met name integreren en differentiëren, differentiaalvergelijkingen, en matrixrekening) en Meten van Fysische Grootheden beheerst. Bij de voorbeelden wordt uitgegaan van enige kennis op het gebied van Biomechanica.

Het wordt aanbevolen om dit vak te volgen in combinatie met het vak Simulatiemodellen van skeletsystemen

## Energy Flow Models

<b>Vakcode</b>	B_ENERFLOW (900675)
<b>Periode</b>	Periode 1
<b>Credits</b>	3.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Bewegingswetenschappen
<b>Coördinator</b>	dr. J.J. de Koning
<b>Examinator</b>	dr. J.J. de Koning
<b>Docent(en)</b>	dr. J.J. de Koning
<b>Lesmethode(n)</b>	Hoorcollege, Computerpracticum
<b>Niveau</b>	500

### Doel vak

To provide the student with knowledge about energy flow models, and so to enable the student to apply this knowledge in the modelling of human endurance performance.

### Inhoud vak

Research in which exercise physiology and biomechanics are combined as a 'toolbox' is apparently unique and successful. This course familiarizes the student with one branch of this approach. Energy flow models, based on power equations, will be used to study performance determining factors in endurance sports. This course explains the technique of modelling, how parameter values are obtained from experiments and how simulations with the model can be done. The student will construct a model of an endurance athlete to study the effect of parameter values on performance in cycling, speed skating and running. The models will be

made in MATLAB. Knowledge of MATLAB is necessary to be successful in this course.

### Onderwijsvorm

Lectures and guided practical;

84 hours (from which 28 practical, 6 lecture, 2 exam and 48 self study).

### Toetsvorm

Written examination and practical report (30%/70%).

### Literatuur

A selection of articles and practical guide on Blackboard.

### Vereiste voorkennis

900104: Biomechanica (Students are expected to have sufficient knowledge of this subject);

900215: Mechanische analyse van het menselijk bewegen (Students are expected to have sufficient knowledge of this subject)

## Evolutionary Computing

<b>Vakcode</b>	X_400111 (400111)
<b>Periode</b>	Periode 1
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	prof. dr. A.E. Eiben
<b>Examinator</b>	prof. dr. A.E. Eiben
<b>Docent(en)</b>	prof. dr. A.E. Eiben, J.V. Heinerman MSc, prof. dr. B. Filipic
<b>Lesmethode(n)</b>	Hoorcollege
<b>Niveau</b>	400

### Doel vak

To learn about computational methods based on Darwinian principles of evolution. To illustrate the usage of such methods as problem solvers and as simulation, respectively modelling tools. To gain hands-on experience in performing experiments.

### Inhoud vak

The course is treating various algorithms based on the Darwinian evolution theory. Driven by natural selection (survival of the fittest), an evolution process is being emulated and solutions for a given problem are being "bred". During this course all "dialects" within evolutionary computing are treated (genetic algorithms, evolutiestrategieën, evolutionary programming, genetic programming, and classifier systems). Applications in optimisation, constraint handling, machine learning, and robotics are discussed. Specific subjects handled include:

various genetic structures (representations), selection techniques, sexual and asexual variation operators, (self-)adaptivity. Special attention is paid to methodological aspects, such as algorithm design and tuning. If time permits, subjects in Artificial Life will be handled. Hands-on-experience is gained by a compulsory programming

assignment.

### Onderwijsvorm

Oral lectures and compulsory programming assignment. Highly motivated students can replace the programming assignment by a special research track under the personal supervision of the lecturer(s).

### Toetsvorm

Written exam and programming assignment (weighted average).

### Literatuur

Eiben, A.E., Smith, J.E., Introduction to Evolutionary Computing. Springer, 2003 ISBN 3-540-40184-9.

Slides available from <http://www.cs.vu.nl/~gusz/ecbook/ecbook.html> .

### Doelgroep

mBA, mAI, mCS, mPDCS

## Experimental Design and Data Analysis

<b>Vakcode</b>	X_405078 ()
<b>Periode</b>	Periode 5
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	dr. E.N. Belitser
<b>Examinator</b>	dr. E.N. Belitser
<b>Docent(en)</b>	dr. E.N. Belitser
<b>Lesmethode(n)</b>	Hoorcollege, Practicum
<b>Niveau</b>	400

### Doel vak

In this course the student is acquainted with the most common experimental designs and regression models. Furthermore nonparametric tests and bootstrap methods are discussed. On completion of this course the student is able to:

- design experiments and analyse the results according to the design
- analyse data using the common anova designs
- analyse data using linear regression or a generalized linear regression model
- perform basic nonparametric tests
- perform bootstrap and permutation tests

### Inhoud vak

Regression models try to explain or predict a dependent variable using measured independent variables. Statistical methods are needed if there is random variation in the dependent variables. We will discuss multiple linear regression, analyses of variance (ANOVA), generalized linear regression models. All methods will be illustrated with practical examples. Especially in the case of ANOVA it is necessary that the study is well designed in order to draw sound conclusions from an experiment or survey. In this course a few well known designs (completely randomized, randomized block etc.) and the associated analyses of variance are discussed. The remainder of the course is dedicated to non-parametric testing methods and bootstrap methods:



- Wilcoxon test for (one and two samples)
- Kolmogorov-Smirnov test (two samples)
- rank correlation tests
- permutation and bootstrap tests

All analyses are carried out by a computer package, for which we need to know code but no formulas.

### Onderwijsvorm

Lectures, computer class, discussion of the computer assignments.

### Toetsvorm

Weekly computer assignments and final assignment. The final grade is based on the written reports of all these assignments.

### Literatuur

literature (course reading)

- slides of the lectures;
- R manual;
- assignments;

For background reading one may look at:

- A first course in the design of experiments; a linear models approach, D.C. Weber and J.H. Skillings (focussing mostly on the mathematics)
- Linear models with R, J.J. Faraway (emphasis on the implementation in R)
- Extending the linear model with R, J.J. Faraway (emphasis on the implementation in R)

### Aanbevolen voorkennis

introductory statistics. e.g. Empirical Methods

### Doelgroep

mAI, mCS

### Overige informatie

All assignments are to be solved using the statistical package R

(<http://www.r-project.org/>)

## Fysieke veiligheid en crisisbeheersing

<b>Vakcode</b>	S_FVC ()
<b>Periode</b>	Periode 4
<b>Credits</b>	6.0
<b>Voertaal</b>	Nederlands
<b>Faculteit</b>	Faculteit der Sociale Wetenschappen
<b>Coördinator</b>	dr. F.P. Wagenaar
<b>Examinator</b>	dr. F.P. Wagenaar
<b>Docent(en)</b>	dr. F.P. Wagenaar, J.J. Wolbers MSc, dr. mr. W.J. Kortleven
<b>Lesmethode(n)</b>	Hoorcollege, Werkgroep
<b>Niveau</b>	500

### Doel vak

Het programma biedt kennis over het 'besturen van veiligheid' rondom de volgende onderwerpen:

- het voorkomen van rampen;

- de bestuurlijke afhandeling van rampen;
- ICT in de crisisbeheersing.

### Inhoud vak

In het seminar wordt de wetenschappelijke kennis op het terrein van fysieke veiligheid en crisisbeheersing zowel in de breedte als - op onderdelen - in de diepte behandeld. Het eerste thema richt zich op het voorkomen van rampen. Het tweede thema handelt over bestuurlijke reacties wanneer een ramp zich daadwerkelijk heeft voorgedaan. Het derde thema betreft de rol van ICT en communicatie in de crisisbeheersing.

### Onderwijsvorm

Hoor- en werkcolleges met verplichte aanwezigheid. Bij de colleges leveren de studenten een actieve bijdrage.

### Toetsvorm

Er wordt getoetst op basis van een take home tentamen.

### Literatuur

Wordt via blackboard bekend gemaakt.

### Doelgroep

Masterstudenten Bestuurskunde, variant BvV

## Governance of Security and Policing

<b>Vakcode</b>	S_GSP ()
<b>Periode</b>	Periode 2
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Sociale Wetenschappen
<b>Coördinator</b>	dr. F. Ostermann
<b>Examinator</b>	dr. F. Ostermann
<b>Docent(en)</b>	dr. F. Ostermann, prof. dr. M.G.W. den Boer
<b>Lesmethode(n)</b>	Hoorcollege
<b>Niveau</b>	500

### Doel vak

In this course, students learn about the most important aspects of security governance at the beginning of the 21st century. They will acquire knowledge of how security governance functions at various levels and how various levels interact and complement one another. At the end of the course, students will have a comprehensive overview of how public authorities address security challenges nowadays.

### Inhoud vak

The course offers a mix of interactive lectures and guest lectures by academic and non-academic experts. The themes for this course are organized around different levels at which security networks are administered – local, national, international, and transnational. Among others, this course will address issues of local security, national police, cybersecurity and international peace operations.

### Onderwijsvorm

Interactive lectures

### Toetsvorm

Assessment is based on an essay.

### Literatuur

Various articles and/or books, to be announced on Blackboard.

### Doelgroep

Master students Bestuurskunde & Politicologie.

### Overige informatie

Please bear in mind that this seminar is in English. This means that passive and active command of the English language in reading, writing and speaking is required, particularly in view of the written exam.

## Health Promotion and Disease Prevention

<b>Vakcode</b>	AM_470811 ()
<b>Periode</b>	Periode 1
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Fac. der Aard- en Levenswetenschappen
<b>Coördinator</b>	dr. M.C. Adriaanse
<b>Examinator</b>	dr. M.C. Adriaanse
<b>Docent(en)</b>	dr. M.C. Adriaanse, prof. dr. I.H.M. Steenhuis, dr. W. Kroeze, I.J. Evenhuis MSc
<b>Lesmethode(n)</b>	Hoorcollege, Werkgroep
<b>Niveau</b>	500

### Doel vak

1. To provide a solid basis in understanding elementary aspects of the theory, research and practice in the field of health promotion & disease prevention
2. To write a scientific study protocol in English about the planned development and evaluation of a preventive health intervention.

### Inhoud vak

This course, fits in the program of the specialization Prevention and Public Health. Within this specialization you are trained to become a health promotor who is able to work in a theory- & evidence-based way and is able to link research, practice and policy. The courses within this specialization are structured according to the six steps of Intervention Mapping. These steps are: 1) Needs assessment, 2) Preparing matrices of change objectives, 3) Selecting theory-informed intervention methods and practical applications, 4) Producing program components and materials, 5) Planning program adoption, implementation, and sustainability and 6) Planning for evaluation. The course Health Promotion and Disease Prevention will introduce you to the six steps of Intervention Mapping. Specific emphasize will be put on step 2 and 3 with a focus on primary prevention.

This course focuses on lifestyle/ health behaviors and environmental differences related to health and diseases among individuals and populations. The ultimate goal is to improve peoples' health status and

quality of life by health promotion interventions. Some examples of the topics that will be addressed are:

- Intervention mapping; designing theory- and evidence-based health promotion programs.
  - Theory-based intervention methods and strategies; theoretical methods that can help to change several of the most important determinants of health behaviors.
  - Computer tailoring & e-health: Use of new media provides opportunities and challenges for the implementation of health education interventions
  - Environmental influences on health. The physical environment and health interact. The importance of environmental interventions and their effect on health are postulated.
  - Health-related quality of life; the role of perceived mental and physical health status in the development of interventions.
  - Effect and process evaluation; principals, perspectives on process evaluation, and determining the effects of health promotion programs.
- Core element in this course is writing a study protocol in English, describing the design of a health promoting or disease preventing intervention trial.

### **Onderwijsvorm**

This course is rewarded with 6 ECTs and runs from 29th September until 24th October 2014. Health Promotion and Disease Prevention is a full-time course, this means that 42 hours a week are necessary to pursue the goals of this course. Regular attendance during the weeks is mandatory.

Teaching activities include: Lectures, tutorials, guest lecturers, group assignment (study protocol), peer review sessions and self study.

### **Toetsvorm**

Grades will be based on the assignment (study protocol) and a written exam that includes multiple choice and open-ended questions. The final grade is being determined by the study protocol (25%) and written exam (75%). The study protocol as well as the written exam must have a grade 5.5 or higher.

### **Literatuur**

The following book is required for students who follow the specialization Prevention and Public Health.

Planning Health Promotion Programs: An Intervention Mapping Approach, 3rd Edition, by L. Kay Bartholomew, Guy S. Parcel, Gerjo Kok, Nell H. Gottlieb, Maria E. Fernandez. February 2011, Hardcover (E-book also available). Chapters which are applicable to this course will be announced through BB.

In addition, students will use a course manual, and additional course materials are provided on Blackboard.

### **Vereiste voorkennis**

At the start of this course, we expect you to master knowledge, insight, attitude and skills at a level which is comparable to the final qualifications stated by the Bachelor Health Sciences at the VU.

### **Aanbevolen voorkennis**

The following courses of the Bachelor health sciences are strongly recommended: 'Preventie' and 'Gezondheidscommunicatie'.

**Doelgroep**

Students with a Bachelor degree or pre-masters in Health Sciences with interest in the field of prevention and public health.

**Intekenprocedure**

Registration for this course via VU-net. Registration for the assignment in subgroups via Blackboard; obligated 1 week before the start of the course.

**Overige informatie**

This course is compulsory within the Master specialization Prevention & public health.

## Health Psychology

<b>Vakcode</b>	AM_470730 ()
<b>Periode</b>	Periode 2
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Fac. der Aard- en Levenswetenschappen
<b>Coördinator</b>	prof. dr. I.H.M. Steenhuis
<b>Examinator</b>	prof. dr. I.H.M. Steenhuis
<b>Docent(en)</b>	prof. dr. I.H.M. Steenhuis, drs. F. te Poel
<b>Lesmethode(n)</b>	Hoorcollege, Werkgroep
<b>Niveau</b>	400

**Doel vak**

The objective of the course 'Health Psychology' is to obtain knowledge and understanding of:

1. coping with diseases;
2. compliance;
3. stigmatization;
4. communication processes between health care workers and their patients;
5. interventions in chronic illness;
6. psychosomatic disorders

## Knowledge:

- You can explain what health psychology is;
- You have insight in and can explain the (historical and recent) development of the field of health psychology;
- You can explain what tertiary prevention is;
- You understand and have insight into the fundamental elements of coping, compliance, stigmatization, doctor-patient communication, self-regulation and psychosomatic disorders. You can explain these before mentioned topics in terms of theory and research;
- You have knowledge of intervention programs in health psychology (tertiary prevention) in theory and practice;
- You have knowledge of research in health psychology.

## Skills:

- You are able to interpret and apply scientific literature in the field of health psychology;
- You are able to develop a feasible Mhealth intervention plan (mobile app aimed at tertiary prevention) based on intervention mapping steps 1-

4 with a specific focus on steps 3 and 4;

- You are able to pitch an idea for a theory-based health psychology intervention (tertiary prevention) in order to bring in funding, in under 10 minutes;
- You are able to pitch in English;
- You can write a short paper in English on the theory regarding a predetermined theme and are able to reflect if and in what way the reality of a guest lecturer (patient) is in accordance with this theory.

### **Inhoud vak**

This course, fits in the program of the specialization Prevention and Public Health. Within this specialization you are trained to become a health promoter who is able to work in a theory- & evidence-based way and is able to link research, practice and policy.

The courses within this specialization are structured according to the six steps of Intervention Mapping. These steps are: 1) Needs assessment, 2) Preparing matrices of change objectives, 3) Selecting theory-informed intervention methods and practical applications, 4) Producing program components and materials, 5) Planning program adoption, implementation, and sustainability and 6) Planning for evaluation

The course Health Psychology will pay special attention to step 3 and 4 of Intervention Mapping with a focus on tertiary prevention.

Health Psychology refers to the psychological aspects of health, illness and the health care system. In the current course 'Health Psychology', six different subjects regarding tertiary prevention, which are relevant in the field of Health Psychology, will be discussed. Psychological aspects which are relevant in treatment of diseases and coping with (chronic) diseases will be studied, as well as the way we can influence these aspects. Questions to be studied will be for example 'How can we improve compliance of patients with diabetes?', and 'How can we improve communication between health care workers and their patients?', and 'How can we diminish stigmatization of HIV-patients?'. These and other questions will be studied in six cases. In all cases, first underlying determinants or psychological processes of the problems have to be studied. Second, interventions to tackle the presented problems or research into the different problems will be studied.

### **Onderwijsvorm**

This course is rewarded with 6 ECTs and runs from week 44 until week 47 2014.

Health Psychology is a full-time course, this means that 42 hours a week are necessary to pursuit the goals of this course. Regular attendance during the weeks is mandatory.

Teaching activities include:

Lectures, tutorials, workgroups, patient guest lectures, pitch sessions.

During the course we use blackboard. Here you can find information, e.g. lectures or alterations to the schedule et cetera.

### **Toetsvorm**

In order to pass for the course you must:

1. Write a plan for the systematic development of an M-health Intervention (mobile app aimed at tertiary prevention) in which you briefly describe Intervention Mapping steps 1 and 2 and emphasize Intervention Mapping steps 3 and 4. In addition you have to pitch your elaborated intervention plan in order to bring in funding. You will

- carry out this assignment in couples (pass mark is 5.5);
2. Hand in your PowerPoint slides (or other materials that you used for the presentation);
3. Attend the three guest lectures by patients;
4. Hand in an individually written report about one of the guest lecturers before the end of the course (pass mark is 5.5);
5. Pass the written exam (pass mark is 5.5).

The final mark for the course is being determined by:

- Assignment 1 consisting of the intervention plan and the corresponding pitch (40%);
- The paper about the guest lecture (10%);
- The written exam (50%).

### **Literatuur**

The following book is required for students who follow the specialization Prevention and Public Health:

Planning Health Promotion Programs: An Intervention Mapping Approach, 3rd Edition, by L. Kay Bartholomew, Guy S. Parcel, Gerjo Kok, Nell H. Gottlieb, Maria E. Fernandez. February 2011, Hardcover (E-book also available)

Chapters which are applicable to the course Health Psychology will be announced through BB.

Furthermore, we will use the following book during this course:

French, D., Vedhara, K., Kaptein, A.A., & Weinman, J. (2010). Health Psychology. West Sussex: BPS Blackwell.

Other literature will be announced in the course manual. Some examples of literature which are relevant for this course are:

Ransom, M.A., Jacobsen, P.B., Schmidt, J.E., & Andrykowski, M.A. (2005). Relationship of problem-focused coping strategies to changes in quality of life following treatment for early stage breast cancer. *Journal of pain and symptom management*, 30 (3), 243-253.

Britt, E., Hudson, S.M., Blampied, N.M. (2004). Motivational interviewing in health settings: a review. *Patient Education and Counseling* 53: 147-155.

Puhl, R., Brownell, K.D. (2003). Ways of coping with obesity stigma: review and conceptual analysis. *Eating Behaviors*, 4:53-78.

### **Vereiste voorkennis**

At the start of this course, we expect you to master knowledge, insight, attitude and skills at a level which is comparable to the final qualifications stated by the Bachelor Health Sciences at the VU.

Specific entry requirements are:

- Knowledge about Intervention Mapping Protocol
- Knowledge about primary and secondary prevention

### **Aanbevolen voorkennis**

The following course of the Master health sciences is strongly recommended: 'Health Promotion and Disease Prevention'.

### **Doelgroep**

Master students Health Sciences. All other students need approval of the course coordinator and the examination committee of their own program.

### Intekenprocedure

Registration for this course via VU-net.

## History of digital cultures

<b>Vakcode</b>	X_418107 ()
<b>Periode</b>	Periode 3
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	O.W. Schrofer
<b>Examinator</b>	O.W. Schrofer
<b>Niveau</b>	400

### Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2014-2015/zoek-vak/vak/14066>

### Overige informatie

Registration is required via <https://www.sis.uva.nl> until four weeks before the start of the semester.

## ICT4D: Information and communication technology for Development

<b>Vakcode</b>	X_405101 ()
<b>Periode</b>	Periode 5
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	dr. K.S. Schlobach
<b>Examinator</b>	dr. K.S. Schlobach
<b>Docent(en)</b>	dr. K.S. Schlobach
<b>Lesmethode(n)</b>	Hoorcollege, Werkcollege
<b>Niveau</b>	400

### Doel vak

In the developed world Computers are ubiquitous, and ICT has rapidly grown into a critical asset for economic, technological, scientific and societal progress. The main objectives of this course are:

1) to make the next generation of Computer Scientists aware of:

- a) The importance of ICTs for the developing world and the unexpected way developing countries are leapfrogging into the information age
- b) The opportunities and challenges that exist for an information scientist in the area of 'development4development'
- c) The influence of context in a typical ICT4D project
- d) The complexity of deploying an ICT project within a development context, and how to tackle this.

2) to equip the students with some initial project management, technological and programming skills specific to an ICT deployment in a



developing country.

Positioned at the heart of the VU's vision of social relevance as one of the guiding principles, the core aim of the course is to raise the awareness that we as Computer Scientists can make a significant difference by sharing our expertise according to well established principles of international development.

### **Inhoud vak**

The course will be given jointly by the Department of Computer Science and the Center for International Cooperation, and will consist of 4 modules: two practical ones, and two theoretical ones.

1) Analysing a development problem (CIS): this theoretical module will introduce the analytical methods required for an indepth understanding of a potential development support project. A number of invited speakers will introduce general requirements and strategies, as well as more focused on a particular potential project.

2) Developing a deployment plan (CIS): in this practical module the students will have to produce a specific deployment plan for an ICT project in a developing country.

3) From plan to project (CS): this theoretical module will provide some initial technological knowledge required for running an ICT project in a developing country. It will give an overview over technology already applied, such as specific networks, connection types, hardware as well as specific software environments, but also introduce basic concepts in project management for ICT projects.

4) Turn projects into tools (CS): In this practical module the students will actually build a set of deployment tools according to the conditions specified in their deployment plan, including building the required infrastructure, setting up hardware, writing and installing required software, including appropriate documentation and user guidance.

Depending on current actual collaborations of CIS and the CS department a specific type of deployment will be chosen. Examination will be via 2 projects related to those concrete deployment activities of ICT in the development context

### **Onderwijsvorm**

The course will be a combination of lectures (first 4 weeks) and project work (weeks 5-8).

### **Literatuur**

Collection of papers.

### **Doelgroep**

mAI, mCS

## Information Visualization

<b>Vakcode</b>	X_418143 ()
<b>Periode</b>	Periode 4
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen

### **Inhoud vak**

### Overige informatie

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

## Intelligent Interactive Systems

<b>Vakcode</b>	X_418023 (418023)
<b>Periode</b>	Periode 1
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	O.W. Schrofer
<b>Examinator</b>	O.W. Schrofer
<b>Niveau</b>	400

### Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2014-2015/zoek-vak/vak/8272>

### Doelgroep

mIS

### Overige informatie

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

## Intelligent Web Applications

<b>Vakcode</b>	X_405055 (405055)
<b>Periode</b>	Periode 4
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	dr. A. Loizou
<b>Examinator</b>	dr. A. Loizou
<b>Docent(en)</b>	dr. A. Loizou
<b>Lesmethode(n)</b>	Hoorcollege
<b>Niveau</b>	400

### Doel vak

The aim of this course is to familiarize students with the technologies of Web 2.0 and Web 3.0, the Semantic Web. At the end of the course, students will have the ability to build full-fledged Web applications that use external (Semantic) web services, and are driven by Artificial Intelligence reasoning.

### Inhoud vak

The course is structured in two parts. The first part consists of classes and assignments that introduce the various technologies needed to build an Intelligent Web application. These technologies are HTTP, HTML, CSS, JavaScript, Ajax, Linked Data, RDF, RDFS, OWL, SPARQL.

During the second part of the course, students work together in small groups to build a real Intelligent Web application.

### Onderwijsvorm

There will be lectures and more hands-on interactive sessions where we show how the technologies are used, plus significant time for self-study and practical work. During the last weeks of the course, there will be no lectures as students will work on projects.

### Toetsvorm

3 Individual Assignments:

- Information access and presentation
- Information integration and reasoning
- Project proposal report

Group project: Develop an Intelligent Web Application

### Literatuur

General technical documentation, selected suggested literature.

### Aanbevolen voorkennis

Familiarity with Web technology, and Semantic Web technology is an advantage, but not a strict requirement.

## Internet programming

<b>Vakcode</b>	X_405082 ()
<b>Periode</b>	Periode 1
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	dr. S. Voulgaris
<b>Examinator</b>	dr. S. Voulgaris
<b>Docent(en)</b>	dr. S. Voulgaris
<b>Lesmethode(n)</b>	Hoorcollege
<b>Niveau</b>	500

### Doel vak

Guide the student through the design and development of Network and Web applications.

### Inhoud vak

The course discusses the principles for understanding, designing, and developing Internet applications. This includes programming the network (sockets, threads, RPC, RMI), programming the web interface (servlets, PHP, Javascript, AJAX), and setting up secure communication channels. Throughout the course, as well as in the context of the lab assignments, attention is paid to practical issues of applying these concepts.

### Onderwijsvorm

Lectures combined with lab assignments

### Toetsvorm

Final exam plus lab assignments

### Literatuur

Course slides

### Vereiste voorkennis

Knowledge of C, Java

### Aanbevolen voorkennis

Good knowledge of both C and Java

### Doelgroep

mAI, mCS, mPDCS

## Knowledge and Media

<b>Vakcode</b>	X_405065 (405065)
<b>Periode</b>	Periode 1
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	P.T. Groth
<b>Docent(en)</b>	prof. dr. A.T. Schreiber
<b>Lesmethode(n)</b>	Werkcollege
<b>Niveau</b>	500

### Doel vak

The goal of the course is to provide insight in the concepts of information organization, knowledge, ontologies and knowledge processes in relation to various ICT-based media.

### Inhoud vak

This course treats the principles and theories that form the foundation of information organization and knowledge-intensive processes in relation to various multi-media applications. Knowledge processes are those processes that use knowledge (reasoning), document knowledge (representation), acquire knowledge or transfer knowledge (teaching). The relation between knowledge processes and (interactive) media will be explored. Various types of applications will be discussed, such as special purpose search engines, educational systems, serious gaming and mind tools.

### Onderwijsvorm

Working lectures

### Toetsvorm

Portfolio

### Literatuur

Articles distributed through Blackboard

We will use The Discipline of Organizing Edited by Robert J. Glushko as a text.

## Doelgroep

UvA students and optional course for mCS, mAI and mIS

## Knowledge Engineering

<b>Vakcode</b>	X_405099 ()
<b>Periode</b>	Periode 2+3
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	dr. A.C.M. ten Teije
<b>Examinator</b>	dr. A.C.M. ten Teije
<b>Docent(en)</b>	dr. A.C.M. ten Teije
<b>Lesmethode(n)</b>	Hoorcollege
<b>Niveau</b>	400

### Doel vak

goals:

- 1) to be able to elicitate knowledge from experts by using several elicitation techniques
- 2) to be able to build all CommonKads models that play a role in the development of a knowledge based system, this includes the context of the KBS and the expertise model based
- 3) to be able to implement the expertise model as a prototype
- 4) to be able to reflect on your own process of modelling and building a knowledge based system, and to reflect on your product (=which are the models and the implementation)

### Inhoud vak

Knowledge Engineering is a discipline that involves integrating knowledge into a program for solving a complex problem, which requires human expertise. Typical tasks are classification, diagnosis, planning etc. In the course we use CommonKADS as the methodology for the process of modeling the organisation, the context and the knowledge intensive tasks.

This methodology give clear guidelines and concrete templates for modeling the organisational aspects and the expertise model, which is the core model of knowledge based system. The notion of pattern-based knowledge modeling is a key issue in the knowledge modelling process. The goal of the final project is to perform the entire knowledge technology process for a knowledge intensive problem of your own choosing, starting with context analysis, up to a (partial) implementation of the knowledge based system.

### Onderwijsvorm

Lectures, assignments, group project

### Toetsvorm

Assignment, project reports.

### Literatuur

Schreiber, Akkermans, Anjewierden, de Hoog, Shadbolt, van de Velde, Wielinga: Knowledge Engineering & Management. The MIT Press, Cambridge MA, 2000, ISBN 0-262-19300-0.

**Doelgroep**

mAI, mIS, mCS-TAI

## Large Scale Data Engineering

<b>Vakcode</b>	X_405116 ()
<b>Periode</b>	Periode 4
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	prof. dr. P.A. Boncz
<b>Examinator</b>	prof. dr. P.A. Boncz
<b>Docent(en)</b>	prof. dr. P.A. Boncz
<b>Lesmethode(n)</b>	Hoorcollege, Werkcollege
<b>Niveau</b>	500

## Logical Verification

<b>Vakcode</b>	X_400115 (400115)
<b>Periode</b>	Periode 5
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	dr. F. van Raamsdonk
<b>Examinator</b>	dr. F. van Raamsdonk
<b>Docent(en)</b>	dr. F. van Raamsdonk
<b>Lesmethode(n)</b>	Hoorcollege, Practicum
<b>Niveau</b>	500

**Doel vak**

Introduction to the proof assistant Coq and its type-theoretic foundations.

**Inhoud vak**

A proof-assistant is used to check the correctness of a specification of a program or the proof of a theorem. The course is concerned with the proof-assistant Coq which is based on typed lambda calculus. In the practical work, we learn to use Coq. One of the exercises is concerned with the correctness proof of the specification of a sorting algorithm, from which a functional program is extracted. In the course, we focus on the Curry-Howard-De Bruijn isomorphism between proofs on the one hand and lambda-terms (which can be seen as functional programs) on the other hand. This is the basis of proof-assistants like Coq. We study various typed lambda calculi and the corresponding logics.

**Onderwijsvorm**

2 times 2 hours theory class, 2 times 2 hours practical work

**Toetsvorm**

Written exam, obligatory Coq-exercises, obligatory hand-in theory exercises.

### Literatuur

Course notes

### Vereiste voorkennis

An introduction course in logic.

### Doelgroep

mCS, mAI, mMath

### Overige informatie

The course is taught once every two years, the next opportunity will be in study year 2014-2015

## Machine Learning: Pattern Recognition

<b>Vakcode</b>	X_418144 ()
<b>Periode</b>	Periode 1
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen

### Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2014-2015/zoek-vak/vak/2000>

### Overige informatie

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

## Master Project

<b>Vakcode</b>	X_400285 (400285)
<b>Periode</b>	Ac. Jaar (september)
<b>Credits</b>	30.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Niveau</b>	600

### Doel vak

The Master programme in Artificial Intelligence is a scientific programme that aims to provide the student with the knowledge, experience and insights needed to autonomously carry out his/her professional duties. The programme is designed to prepare the student for further education as scientific researcher (Ph. D. studies) as well as to offer a solid basis for a career in business at an academic level. Moreover, the programme aims at educating the student as to acquire a practical understanding of the position of the field of Artificial Intelligence within a broad scientific, philosophic and social context.

### Inhoud vak

Each Master AI programme is finished with a master project AI. This; can be an individual project as well as a group project. Information; about projects (incl. internships) can be found on the Internet pages; of the AI divisions. Internships proposed by the student him/herself; need approval in advance from a member of staff, who will also be; involved with supervising the project.

The size of the graduation projects is as such that with adequate; foreknowledge and complete study, the project can be finished within; 6 months.

The student participates in the KIM (Kunstmatige Intelligentie; Meeting). See blackboard KIM.

### Onderwijsvorm

The Master Project has always to be supervised by a staff member, in the case of an internship in cooperation with a supervisor in the company. Internships proposed by the student him/herself need approval in advance from a member of staff, who will cooperate with supervising the project.

### Toetsvorm

The final grade will be based on the quality of the research, the written thesis, the KIM presentations and the participation in the KIM.

### Doelgroep

mAI

### Overige informatie

For all rules, assessment criteria, contact persons, and many practical tips for your master project, see the KIM blackboard page (inclusive the "Manual for the Master Project AI") and <http://wiki.cs.vu.nl/mp>

## Master Thesis: Research Project Cognitive Science

<b>Vakcode</b>	P_MTHRCSC (815067)
<b>Periode</b>	Ac. Jaar (september)
<b>Credits</b>	30.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Psychologie en Pedagogiek
<b>Coördinator</b>	prof. dr. J.L. Theeuwes
<b>Examinator</b>	prof. dr. J.L. Theeuwes
<b>Niveau</b>	400

### Doel vak

To learn how to perform research and report about it. Projects involve basic research, applied research, research concerning modeling, or a combination of these.

### Inhoud vak

Students participate in a research project concerning Cognitive Science. The Thesis can be done at the department of Cognitive Psychology (FPP), the department of Artificial Intelligence (FEW), an external research organization (for example TNO), a company, or another (foreign) university.

Before starting, a written research plan should be submitted to the head of the department of Cognitive Psychology or the head of the



department of Artificial Intelligence. Participation in a research project can only start after approval of the research plan. The research performed by the student forms the basis for the Thesis. The Master Thesis should be written in article style. Students will be supervised by a person from the academic staff of the department of Cognitive Psychology or the department of Artificial Intelligence. There will be at least one meeting a week between the student and the supervisor.

### **Toetsvorm**

The final grade for the Master Thesis will be based on the quality of both the research and the written thesis. Grading will be done by the direct supervisor and the head of the department.

It is required that students present their research in the form of a talk during a research meeting. Students are also required to attend at least four research meetings at the department of Cognitive Psychology. It is finally required that students participate in the KIM meetings according to the rules as outlined on the web- site of the KIM meetings.

## **Memory and Memory Disorders**

<b>Vakcode</b>	P_MMEMORY (815102)
<b>Periode</b>	Periode 2
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Psychologie en Pedagogiek
<b>Coördinator</b>	dr. R.J. Godijn
<b>Examinator</b>	dr. R.J. Godijn
<b>Docent(en)</b>	dr. R.J. Godijn
<b>Lesmethode(n)</b>	Hoorcollege
<b>Niveau</b>	400

### **Doel vak**

The course aims to give students an overview of memory at the cognitive and neurophysiological level, and to give students the background to interpret memory disorders in patients with brain damage.

### **Inhoud vak**

The course focuses on various approaches in the study of human memory and memory disorders. We will discuss working memory, encoding-retrieval interactions, interference and forgetting implicit memory, and the brain substrate of memory. We will also discuss clinical testing of memory, and memory loss after local brain damage, dementia, and other conditions.

### **Onderwijsvorm**

12 two- hour lectures and workshops, assignments and oral presentations.

### **Toetsvorm**

Exam, assignments, and presentation.

### **Literatuur**

Various papers, to be announced via Blackboard.

### Overige informatie

This course will be lectured once every two years; the course will be NOT be lectured in 2013-14, but will be lectured in 2014/15.

## Mini-Master Project AI

<b>Vakcode</b>	X_400428 (400428)
<b>Periode</b>	Ac. Jaar (september)
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	dr. M. Hoogendoorn
<b>Examinator</b>	dr. M. Hoogendoorn
<b>Niveau</b>	500

### Doel vak

Gaining deeper insight into a specific topic in AI.

### Inhoud vak

This course consists of a small project on a specific topic in AI, selected in agreement with your supervisor. The project may have various forms, such as a literature study, the design of a piece of software, or exploring a research question. The results of the project are described in a brief report. To start, students should contact the coordinator of the projects: dr. M. Hoogendoorn ([m.hoogendoorn@vu.nl](mailto:m.hoogendoorn@vu.nl)).

### Onderwijsvorm

Individual project and written report.

### Toetsvorm

The end grade is based on both the project and the written report.

### Doelgroep

mAI

### Overige informatie

Depending on the interest of the student, a specific topic is selected and an individual supervisor is assigned.

## Misdaadanalyse en daderprofilering

<b>Vakcode</b>	R_Misd.anaC (212404)
<b>Periode</b>	Periode 2
<b>Credits</b>	6.0
<b>Voertaal</b>	Nederlands
<b>Faculteit</b>	Faculteit der Rechtsgeleerdheid
<b>Coördinator</b>	dr. J.J. van der Kemp
<b>Examinator</b>	dr. J.J. van der Kemp
<b>Docent(en)</b>	drs. W.M.E.H. Beijers, dr. J.J. van der Kemp
<b>Lesmethode(n)</b>	Hoorcollege, Werkcollege
<b>Niveau</b>	400

### Doel vak

Studenten kennis en inzicht geven over de wetenschappelijke stand van zaken van de theorie en praktijk van verschillende typen van misdaadanalyse.

### Inhoud vak

Misdaadanalyse is het gebruiken van (wetenschappelijke) methoden voor het analyseren van criminaliteit op strategisch, tactisch en operationeel niveau. Zo worden jaarlijkse trends van typen misdrijven onderzocht, maar ook analyses gedaan van lopende, operationele zaken. Het vakgebied van de misdaadanalist ontwikkelt zich in hoog tempo, waarbij de interactie tussen de praktijk en de wetenschap van groot belang is.

In de colleges wordt aandacht besteed aan de actuele ontwikkeling binnen de opsporing en handhaving naar informatie- en probleemgestuurd werken om het kader te schetsen van de rol die misdaadanalyse daarin speelt. Daarna komt een selectie van methoden van misdaadanalyse aan bod en worden deze voorzien van wetenschappelijke reflectie. Achtereenvolgens zullen strategische analyses vanuit probleemgestuurd (POP-policing) perspectief en geografische analyses als Hot Spots besproken worden. Meer specialistische vormen van criminaliteitsanalyse, bekend als gedragskundige analyse, als geografische en psychologische daderprofilering sluiten de reeks af.

Verschillende vormen van misdaadanalyse zullen in de toekomst een steeds grotere rol spelen in de preventie en de opsporing van criminaliteit, alsmede bij het ontwikkelen van beleid door politie, justitie, het openbaar bestuur en de beveiligingsindustrie.

### Toetsvorm

Nader bekend te maken

### Literatuur

Nader bekend te maken.

## Mobile Systems

<b>Vakcode</b>	X_418068 ()
<b>Periode</b>	Periode 4
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	O.W. Schrofer
<b>Examinator</b>	O.W. Schrofer
<b>Niveau</b>	400

### Inhoud vak

<http://studiegids.uva.nl/xmlpages/page/2014-2015/zoek-vak/vak/8034>

### Doelgroep

mIS

### Overige informatie

Registration is required via <https://www.sis.uva.nl> until four weeks before the start of the semester.

## Model-based Intelligent Environments

<b>Vakcode</b>	X_405056 (405056)
<b>Periode</b>	Periode 1
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	dr. M.C.A. Klein
<b>Examinator</b>	dr. M.C.A. Klein
<b>Docent(en)</b>	prof. dr. J. Treur, dr. M.C.A. Klein, dr. T. Bosse
<b>Lesmethode(n)</b>	Hoorcollege
<b>Niveau</b>	500

### Doel vak

The student will understand different ways in which computerized models can be used in intelligent support systems, and will develop a prototype of such a system based on approaches described in the literature.

### Inhoud vak

During their bachelor and first year of the master, students have learned to model human processes using different techniques and at different levels of abstraction. In addition, they have learned to use such models for analysis of situations and reasoning about effective support. In this course, the modeling knowledge will be further deepened and applied to a specific domain or scenario. Scientific literature and applications of model-based reasoning will be studied. The student will develop a prototype of an application based on models relevant for a scenario chosen by the student. By building this prototype, the student shows that he/she masters the modeling approaches and is able to apply this in a specific domain or scenario.

### Onderwijsvorm

Lectures and project.

### Toetsvorm

Assignments.

### Literatuur

Papers

### Aanbevolen voorkennis

Introduction to Modeling and Simulation, Integrative Modeling

## Multimedia Information Systems

<b>Vakcode</b>	X_418070 ()
<b>Periode</b>	Periode 2
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels

<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	O.W. Schrofer
<b>Examinator</b>	O.W. Schrofer
<b>Niveau</b>	400

### Inhoud vak

The course description is available on:

<http://studiegids.uva.nl/web/uva/sgs/en/c/11381.html>

### Doelgroep

mIS

### Overige informatie

Registration is required via <https://www.sis.uva.nl> until four weeks before the start of the semester.

## Networked Organizations and Communication

<b>Vakcode</b>	S_NOC ()
<b>Periode</b>	Periode 2
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Sociale Wetenschappen
<b>Lesmethode(n)</b>	Hoorcollege, Practicum, Werkgroep
<b>Niveau</b>	500

### Doel vak

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

### Inhoud vak

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

### Onderwijsvorm

Lectures combined with workshops about two different network analysis methods. Active participation in the lectures and method workshops is required.

### Toetsvorm

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

### Literatuur

Series of articles to be announced on Blackboard.

### Vereiste voorkennis

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

### Aanbevolen voorkennis

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

Non-BCO student who cannot participate in Organization Sciences (S\_OS) are strongly recommended to study the literature of this course.

### Doelgroep

MSc BCO track Strategie en identiteit, exchange students, and students SBI.

## Neurale Netwerken

<b>Vakcode</b>	X_400132 (400132)
<b>Periode</b>	Periode 1
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	dr. M. Hoogendoorn
<b>Examinator</b>	dr. M. Hoogendoorn
<b>Docent(en)</b>	dr. M. Hoogendoorn
<b>Lesmethode(n)</b>	Hoorcollege, Practicum
<b>Niveau</b>	500

### Doel vak

The course provides an introduction to key concepts and algorithms for pattern recognition and neural networks. It strives towards providing insight both from a theoretical perspective as well as more practical settings. In the end, the student should be able to confidently apply the aforementioned techniques in real-life settings and understand their theoretical basis.

### Inhoud vak

The course provides an introduction to key concepts and algorithms for pattern recognition and neural networks. It covers the following topics:

- classification, regression, and clustering problems,
- elements of statistical pattern recognition,
- methods for estimation of probability distributions,
- linear classifiers, including Support Vector Machines,
- single-layer and multi-layer networks,
- RBF-networks and kernel methods
- methods for dimensionality reduction
- methods for feature extraction and selection

Moreover, several real-life applications of pattern recognition, including recognition of speech, handwritten characters, images, etc., will be discussed in depth.

#### Onderwijsvorm

Lectures and compulsory programming assignments.

#### Toetsvorm

Programming assignments and written examination (weighted average).

#### Literatuur

Simon Haykin, Neural Networks and Learning Machines, Pearson Education, 3rd international edition, 2008

#### Doelgroep

mAI mBio, mBA, mCS

#### Overige informatie

More information will be available via Blackboard.

## Neuropsychology of Cognitive Dysfunctioning

<b>Vakcode</b>	P_MNCDYSF (815099)
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Psychologie en Pedagogiek
<b>Coördinator</b>	dr. C.M. Licht
<b>Lesmethode(n)</b>	Hoorcollege
<b>Niveau</b>	400

#### Overige informatie

This course will not be lectured anymore from 2012/13. A transitional regulation is applied to students that have attended this course in 2011/12 or earlier, but not succeeded yet.

Students who have attended this course in 2011/12 or earlier, but not succeeded yet, are granted the opportunity to successfully complete the course by making an exam and giving a presentation. Basically the exam is provided in the same period as last year. Take a look at VUnet or [www.rooster.vu.nl](http://www.rooster.vu.nl) for the exact time schedule. Students have to enroll for the course and the exam in VUnet. Students also have to contact their teacher to be able to make a presentation. The final result for the course will only be given if the exam as well as the presentation is passed.

## Ondernemerschap en innovatie, een relationeel perspectief

<b>Vakcode</b>	S_OIRP ()
<b>Periode</b>	Periode 2
<b>Credits</b>	6.0
<b>Voertaal</b>	Nederlands
<b>Faculteit</b>	Faculteit der Sociale Wetenschappen
<b>Coördinator</b>	dr. I.A.M. Wakkee

<b>Examinator</b>	dr. I.A.M. Wakkee
<b>Docent(en)</b>	dr. I.A.M. Wakkee
<b>Lesmethode(n)</b>	Hoorcollege, Werkgroep
<b>Niveau</b>	500

### Doel vak

Theoretische verdieping van ondernemerschap en innovatie in organisaties en samenwerkingsverbanden. Studenten ontwikkelen kennis van en inzicht in verschillende theoretische perspectieven op het gebied van intern ondernemen, de relatie tussen ondernemerschap en innovatie en de belangrijkste antecedenten en gevolgen van beide waarbij specifieke aandacht zal worden geschonken aan de rol die sociale netwerken en samenwerkingsverbanden hierbij spelen. De concrete leerdoelen van dit vak zijn als volgt geformuleerd. Na afloop van dit vak

- Hebben deelnemende studenten kennis en inzicht verworven in ondernemerschap en innovatie netwerk en sociaal kapitaal perspectief
- Zijn zij in staat om
- te reflecteren op de toepassing van relevante netwerkconcepten op praktijkgevallen (cases) van ondernemerschap en innovatie
- een praktijkprobleem te vertalen naar onderzoekbare vragen
- sociale netwerkconcepten en bijbehorende onderzoeksmethoden toe te passen in kleinschalig empirisch onderzoek
- Mondeling en schriftelijk te rapporteren over de toepasbaarheid van sociaal netwerk onderzoek op de uitdaging van innovatie en ondernemerschap (organisationele vernieuwing)

### Inhoud vak

In dit vak wordt aandacht besteed aan hedendaagse vraagstukken met betrekking tot vernieuwing van en in organisaties. Ondernemerschap wordt hier gezien als het najagen van kansen ongeacht de beschikbare middelen. Daarmee wordt afgeweken van de meer strategische benaderingen van organisatievraagstukken die uitgaan van optimale inzet van beschikbare middelen. Naast aandacht voor verschillende vormen van ondernemerschap en innovatie binnen organisaties zal er ook aandacht worden geschonken aan de rol van samenwerkingsverbanden tussen verschillende soorten organisaties.

### Onderwijsvorm

Het vak bestaat uit drie delen. Het eerste deel (5 bijeenkomsten van 3 uur)

bestaat uit een serie hoor- en discussiecolleges waarin de verplichte literatuur wordt besproken. Studenten dienen ter voorbereiding op deze colleges – dus ook het openingscollege - de verplichte literatuur horende bij dat college kort en bondig (max 1 A4 per artikel) te parafaseren waarbij de nadruk ligt op het bespreken van de kernconcepten en de koppeling tussen probleem en gehanteerde methode. Een aantal studenten zal tijdens de bijeenkomsten worden gevraagd hier een mondelinge toelichting op te geven. Het gemiddelde cijfers voor de 6 parafrases tellen mee voor 40% van het eindcijfer.

Het tweede deel bestaat uit de voorbereiding van een klein empirisch onderzoek (formulering van een vraagstelling en ontwikkeling methode) gericht op een (praktisch) relevant vraagstuk over ondernemerschap en innovatie dat zij samen met een organisatie waar zij dit onderzoek zullen uitvoeren identificeren. Hiertoe schrijven de studenten in kleine groepjes een kort onderzoeksvoorstel. Het onderzoeksvoorstel dat in duo's of trio's wordt voorbereid telt voor 20% mee in het eindcijfer.



Ter ondersteuning worden in een drietal workshops, verschillende methoden en technieken van netwerkonderzoek besproken in relatie tot de voorgestelde onderzoeksideeën.

Deel drie bestaat uit het uitvoeren (in duo's of trio's) van het empirische deel van het onderzoek binnen de organisatie en wordt afgesloten met een kort en

bondig adviesrapport aan de organisatie alsmede met een presentatie.

Studenten kunnen in maximaal 2 keer langskomen voor een korte feedbacksessie met de docent. Het eindrapport telt voor 40% mee in het eindcijfer voor dit vak daarbij moet duidelijk worden aangegeven welk deel van het rapport door elk groepslid is geschreven (bijlage een logboek van activiteiten). De presentatie van dit rapport kan maximaal een

half punt bonus of aftrek voor dit onderdeel opleveren.

Aanwezigheid tijdens alle bijeenkomsten van deel 1 is verplicht.

Studenten die een of meerdere bijeenkomsten missen moeten (ongeacht de reden) dienen een relevante compenserende opdracht te vervullen die samenhangt met het thema van de bijeenkomst.

### **Toetsvorm**

Continue assessment aan de hand van individuele en groepsopdrachten

### **Literatuur**

15 to 20 recent scientific articles to be announced

### **Vereiste voorkennis**

Deelname aan Organization Sciences (S\_OS).

### **Doelgroep**

Master studenten BCO.

### **Overige informatie**

Van studenten wordt tevens verwacht dat zij in staat zijn een parafraze te schrijven en enige kennis hebben van het opstellen van een onderzoeksvoorstel

Daarnaast zullen studenten zelf toegang moeten organiseren tot een organisatie waarbinnen zij hun kleinschalige empirische onderzoek kunnen uitvoeren. De docent zal hierbij uiteraard wel adviseren.

## **Operating Systems**

<b>Vakcode</b>	X_405067 (405067)
<b>Periode</b>	Periode 5
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	C. Giuffrida
<b>Examinator</b>	C. Giuffrida
<b>Docent(en)</b>	dr. S. Voulgaris
<b>Lesmethode(n)</b>	Hoorcollege
<b>Niveau</b>	400

**Doel vak**

Get an insight into the internals of operating systems for single-processor machines.

**Inhoud vak**

This course gives an introduction to the internals of Operating Systems. The following topics are covered: processes, synchronization, memory allocation, multi-programming, input / output, protection. The course focuses on the MINIX operating system as a testbed for experimentation.

**Onderwijsvorm**

Lectures

**Toetsvorm**

Written exam

**Literatuur**

Tanenbaum, A.S., Woodhull, A.S., Operating Systems, "Design and Implementation 3rd edition". Prentice-Hall, 2006.

**Overige informatie**

Students who have included the course Bedrijfssystemen (X\_400011) in their Bachelor's program must not follow this course for their Master's program.

## Parallel Programming for High-performance Applications

<b>Vakcode</b>	X_400161 (400161)
<b>Periode</b>	Periode 1
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	prof. dr. ir. H.E. Bal
<b>Examinator</b>	prof. dr. ir. H.E. Bal
<b>Docent(en)</b>	prof. dr. ir. H.E. Bal
<b>Lesmethode(n)</b>	Hoorcollege
<b>Niveau</b>	400

**Inhoud vak**

This lecture discusses how programs can be written that run in parallel on a large number of processors, with the goal of reducing execution time. The class has a brief introduction into parallel computing systems (architectures). The focus of the class, however, is on programming methods, languages, and applications. Both traditional techniques (like message passing) and more advanced techniques (like parallel object-oriented languages) will be discussed. Several parallel applications are discussed, including N-body simulations and search algorithms. About 4 lectures are devoted to an important new development: programming many-core machines such as Graphical Processing Units (GPUs). The class fits well with existing research projects within the department of Computing Systems. It is a good basis for M.Sc. projects in the area of parallel programming, which use the parallel computing systems of the department.

**Onderwijsvorm**

Class with separate practicum (6 ECTS).

### Toetsvorm

Written exam.

### Literatuur

To be announced.

### Vereiste voorkennis

Knowledge about the first part of the class Parallel Programming is recommended (introduction into parallel programming, MPI, and Java).

### Doelgroep

mAI, mBIO, mCS, mPDCS

## Perception for Action

<b>Vakcode</b>	B_PERCACTION (900810)
<b>Periode</b>	Periode 4
<b>Credits</b>	3.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Bewegingswetenschappen
<b>Coördinator</b>	prof. dr. J.B.J. Smeets
<b>Examinator</b>	prof. dr. J.B.J. Smeets
<b>Docent(en)</b>	prof. dr. J.B.J. Smeets
<b>Lesmethode(n)</b>	Hoorcollege, Computerpracticum
<b>Niveau</b>	500

### Doel vak

The student is able to:

- describe the functioning of the sensory systems relevant for motor control;
- interpret scientific literature in the area of perception and apply it to the field of motor control.

### Inhoud vak

The topic of this course is the question: how is sensory information processed to guide ones action? More specific: how do we know where a target and (a part of) our body is? The answers to these questions require knowledge about the sensory organs, their signals, and how these signals are processed and combined in order to be used to control our actions. Each topic (e.g. proprioception, binocular vision) is introduced by a lecture, but the focus of the course is on the discussion of papers of the last decade. The discussion will be about both the phenomenology and the mechanisms.

### Onderwijsvorm

Amount of contact hours:

Lectures (' hoorcolleges') 7

Tutorials (' werkcolleges') 7

Assignments & self study 68

Practicals 2

Each meeting will be a combination of tutorial consisting of a

discussion of the previous assignment (1 hour), and a lecture introducing to the topic of the next assignment (1 hour)

In the practical, the students will compare two psychophysical techniques and discuss their effectiveness in answering the question what perceptual information is available.

### Toetsvorm

After each lecture, students receive an assignment. Six of them have to be handed in before the next meeting. These assignments are graded, and count for 10 % of the final grade. The assignment after the final lecture will contribute 35 %: the remaining 5% on completion of the practical.

### Literatuur

Literature needed for the course will be distributed during the course.

### Vereiste voorkennis

No entry requirements. Basic knowledge of the nervous system is expected (e. g. function of various brain areas).

### Overige informatie

- The maximum number of participants in this course is limited to 40

## Prevention of Mental Health Problems

<b>Vakcode</b>	AM_470840 ()
<b>Periode</b>	Periode 3
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Fac. der Aard- en Levenswetenschappen
<b>Coördinator</b>	M.J. Bouwman MSc
<b>Examinator</b>	M.J. Bouwman MSc
<b>Docent(en)</b>	prof. dr. W.J.M.J. Cuijpers
<b>Lesmethode(n)</b>	Hoorcollege, Werkgroep, Computerpracticum
<b>Niveau</b>	400

### Doel vak

Knowledge and insight

- Student will have knowledge and insight on the most important theoretical insights and concepts in the field of preventing mental health problems.
- Students will be up to date with knowledge on relevant prevention effectiveness studies.
- Students will be familiar with different mental illness prevention techniques used in clinical practice.
- Students will have know-how on how to plan for and evaluate the effects of mental illness prevention studies.

### Skills

- Students will be able to mention and describe the most important theoretical and scientific concepts about the prevention of mental health problems.
- Students will be able to use the acquired theoretical and scientific knowledge to evaluate existing literature on prevention programs.

- Students will be able to use existing literature on a self-chosen problem to discuss its current state of affairs and construct concrete recommendations as to how preventive mental healthcare can be improved on this topic.

#### Attitude

- Students will be aware of the societal relevance of prevention programs and their positions within their own discipline of study.
- Students will grasp the interdisciplinary character of prevention programs.
- Students will understand the most important obstacles in implementing mental illness prevention programs.
- Students will understand the relevance of research and funding in this field.

#### Inhoud vak

For Health Science students this course fits in the program of the specialization Prevention and Public Health. Within this specialization you are trained to become a health promotor who is able to work in a theory- & evidence-based way and is able to link research, practice and policy.

The courses within this specialization are structured according to the six steps of Intervention Mapping. These steps are: 1) Needs assessment, 2) Preparing matrices of change objectives, 3) Selecting theory-informed intervention methods and practical applications, 4) Producing program components and materials, 5) Planning program adoption, implementation, and sustainability and 6) Planning for evaluation.

For Psychology students this fits in the program of the Clinical Psychology specialization. Within this specialization you are trained to become a psychologist specializing in either the research, policy or practice of mental health care. Most courses in this specialization can be freely chosen and are all specific subtopics in mental healthcare, usually aimed at specific disorders or types of treatment.

The course Prevention of Mental Health Problems will pay special attention to step 3 through 6 of Intervention Mapping with a focus on mental health.

Theoretical backgrounds of the prevention of mental health problems will be discussed, as well as currently used methods in preventive mental health care. Guest lecturers who work in the field of preventive mental health care will discuss current programs aimed at preventing several psychological symptoms and disorders. Also, the most important results of research conducted in the field of preventive mental health care will be presented. There will also be a focus on the implementation and evaluation of mental illness prevention programs.

In the practicals students will tackle a self-chosen problem within the field of preventive mental healthcare, writing a report on it and presenting their most important recommendations.

Because this is an interdisciplinary course and students from several Master tracks are welcome to follow this course, we provide quick 'crash courses' in the topics of prevention and psychopathology with additional literature to get students up to speed on the discipline they are not yet familiar with.

All lectures and work group meetings will be taught in English. All

examination will be done in English as well.

### **Onderwijsvorm**

This course is rewarded with 6 ECTs and runs from January 6 to January 30 2015.

Prevention of Mental Health Problems is a full-time course, this means that 42 hours a week are necessary to pursue the goals of this course. Regular attendance during the weeks is mandatory.

Teaching activities include: lectures, work group meetings, consultation hours, feedback on assignments, answers to questions via the Discussion forum on BB.

### **Toetsvorm**

An individual written examination that counts for 60% of the final grade of this course.

A written assignment conducted in couples that counts for 30% of the final grade of this course.

A presentation on the written assignment conducted in couples, but graded individually, that counts for 10% of the final grade of this course.

To pass this course you have to have at least a 5.5 for both the individual exam, the presentation and the assignment.

### **Literatuur**

The following book is required for students who follow the specialization Prevention and Public Health:

Planning Health Promotion Programs: An Intervention Mapping Approach, 3rd Edition, by L. Kay Bartholomew, Guy S. Parcel, Gerjo Kok, Nell H. Gottlieb, Maria E. Fernandez. February 2011, Hardcover (E-book also available)

Chapters which are applicable to this course will be announced through BB.

For Clinical Psychology and Artificial Intelligence students we will try to find a solution to only make the relevant chapters available.

Other literature will be provided through BB or as a reader. Some examples of literature which are relevant for this course are:

- Beekman, A.T.F., Smit, F., Stek, M.L., Reynolds, C.F., & Cuijpers, P.C. (2010). Preventing depression in high-risk groups. *Current Opinion in Psychiatry*, 23(1), 8–11. doi: 10.1097/YCO.0b013e328333e17f
- Holmes E.A., James E.L., Kilford E.J., & Deerprouse, C. (2012). Key Steps in Developing a Cognitive Vaccine against Traumatic Flashbacks: Visuospatial Tetris versus Verbal Pub Quiz. *PLoS ONE* 7(11). doi: 10.1371/annotation/eba0a0c8-df20-496b-a184-29e30b8d74d0
- Koning, I.M., Vollebergh, W.A.M., Smit, F., Verdurmen, J.E.E., van den Eijnden, R.J.J.M., ter Bogt, T.F. M. et al. (2009). Preventing heavy alcohol use in adolescents (PAS): cluster randomized trial of a parent and student intervention offered separately and simultaneously. *Addiction* 104, 1669-

### Vereiste voorkennis

At the start of this course, we expect you to have mastered knowledge, insight, attitude and skills at a level which is comparable to the final qualifications stated by the Bachelor of either Health Sciences, Psychology or Artificial Intelligence at the VU.

### Aanbevolen voorkennis

- Basic knowledge of psychopathology (symptoms of the most common psychiatric disorders).
- Basic knowledge on what prevention programs are and how they are Developed

### Doelgroep

Health Science, Psychology and AI students.

### Overige informatie

Registration for this course via VU-net.

## Psychology of Effective Gaming

<b>Vakcode</b>	X_418145 ()
<b>Periode</b>	Periode 1
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	O.W. Schrofer
<b>Examinator</b>	O.W. Schrofer

### Overige informatie

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

## Research Methods

<b>Vakcode</b>	X_405085 ()
<b>Periode</b>	Periode 2
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	prof. dr. J.M. Akkermans
<b>Examinator</b>	prof. dr. J.M. Akkermans
<b>Docent(en)</b>	prof. dr. J.M. Akkermans
<b>Lesmethode(n)</b>	Hoorcollege
<b>Niveau</b>	500

### Doel vak

This course helps prepare students for scientific research and particularly their Master research project and thesis.

After completion of the course the student:

- is able to conceptualize the problem space at hand and formulate a clear research question in the field of information studies, information sciences or AI
- is able to find, analyse and critically reflect on and use scientific literature relevant to the research context
- is able to design a research plan containing applicable research methods, covering qualitative, quantitative and constructive elements typical to the field
- is able to defend his research design with solid argumentation explaining the underlying assumptions, pros and cons etc. of the chosen methods.
- is able to collect and process the research data and to critically judge the obtained results in relation to the research questions
- is able to describe and critically discuss the above activities in a written report, in which the methodology is accounted for and the original phrasing is substantiated
- is able to present and discuss the results to a scientific audience

### **Inhoud vak**

The course provides an interdisciplinary overview of and hands-on work with different scientific research methods, with an emphasis on ICT/information systems and technologies in interaction with their human, social and organizational contexts.

Topics are:

- scientific research and its goals, the idea of scientific method;
- developing and framing the research questions you want to answer;
- making a research design and planning your research;
- conceptualization, theory formation and validation/triangulation;
- research methods and their assumptions, pros and cons (e.g. interview, observation, case study, field and action research, modelling and simulation, experiment, survey, statistical analysis);
- how do you (and others) know that your research results are valid?
- scientific argument, communication and research report writing.

### **Onderwijsvorm**

In addition to lectures on various aspects of and issues in research methodology, students will get hands-on experience with different research methods. The setting of the practical work is that of a continuing research case investigation that emulates the different stages of a scientific research project. The research case question to be investigated is: What is it for systems to be considered "smart" or intelligent"?

### **Toetsvorm**

Group assignments (research project report), individual assignments, take-home written exam, active course participation (incl. self-report).

### **Literatuur**

Textbook: Colin Robson: Real World Research, 3rd Ed., Wiley, 2011 [Note: this book is available in hardcover, paperback and a digital edition]. Other sources will be announced via Blackboard.

### **Vereiste voorkennis**



Basic knowledge of qualitative and quantitative research methods.

### Doelgroep

mAI, mIS

## Review Paper

<b>Vakcode</b>	P_MREVPAP (815104)
<b>Periode</b>	Ac. Jaar (september)
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Psychologie en Pedagogiek
<b>Coördinator</b>	dr. M. Meeter
<b>Examinator</b>	dr. M. Meeter
<b>Niveau</b>	500

### Doel vak

To write a current literature review that covers an open issue in clinical or cognitive (neuro)psychology.

### Inhoud vak

The review paper is a literature review written by the student under supervision of a member of the department of Clinical Neuropsychology or the department of Cognitive Psychology. Students may write a review on the basis of a self-selected topic provided that they find a member of the department willing to supervise the writing of the paper.

The topic must be narrow enough for the students to cover the literature within the designed period, but must be broad enough so that something is gained from writing a review, and must be of current interest in the literature.

-The review must be written at such level that it could be published in an academic journal

### Onderwijsvorm

Students will be individually monitored and instructed by their supervisor in writing a literature review.

Further guidelines are given on the blackboard site 'Master Thesis Cognitive Neuropsychology'

### Toetsvorm

The literature review is evaluated on the basis of the quality of paper and is graded by the supervisor.

### Literatuur

Depends on the topic of research.

### Overige informatie

The supervisor for the review paper cannot also be a thesis supervisor. The topic of the review may not be the same as the topic of the review written in PSR.

## Seminar Attention

<b>Vakcode</b>	P_MSEMATT (815100)
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<b>Periode</b>	Periode 5
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Psychologie en Pedagogiek
<b>Coördinator</b>	prof. dr. J.L. Theeuwes
<b>Examinator</b>	prof. dr. J.L. Theeuwes
<b>Docent(en)</b>	prof. dr. J.L. Theeuwes
<b>Lesmethode(n)</b>	Hoorcollege
<b>Niveau</b>	400

### Doel vak

To learn how to interpret and analyze theories and findings on attention and eye-movements. Learn how to set up experiments. Learn how to present and to write an essay.

### Inhoud vak

The format of the seminar will be a discussion of one or two target articles, and student presentations, each week. Target articles for each week will be "classic" articles representing early and/or important studies on a specific topic or recent new papers in attention and eye movements. For the presentations, each student has to present the main findings of the target article for that week and is required to find a recent paper on the topic covered by the target article. Students have to prepare a 20 minute oral presentation in Microsoft Powerpoint. The rest of the class will be spent discussing the target articles and their relationship to the presented papers. Each student will give two presentations. The presentation will determine 30% of the course grade for each student. The target papers will be available on the course website and accessible via blackboard. One week after the last class, each student will submit a final paper (up to 8 pages, 12 pt. font, double spaced) on one of the topics covered in class. The paper will consist of a brief review of (at least) 6 research papers (including those already covered on that topic in class) and a proposal for a new experiment. The paper will be worth 40%. Each class all students have to turn in a sheet of paper with a short question/remark about one of the papers discussed during that class (30% of the grade). Students will receive an introduction into the arts of oral presenting and of writing an essay as a preparation to the assignments.

### Onderwijsvorm

Lectures and practical assignments.

### Toetsvorm

Student presentation (30%), and writing a paper (40%) and sheet of paper with a short question/remark about one of the papers discussed (30%). Students are required to be present during all meetings. Attending the class is required.

### Literatuur

Articles.

## Seminar Cognitive Neuroscience

<b>Vakcode</b>	P_MSEMCNS (815098)
<b>Periode</b>	Periode 2

<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Psychologie en Pedagogiek
<b>Coördinator</b>	dr. A.V. Belopolskiy
<b>Examinator</b>	dr. A.V. Belopolskiy
<b>Docent(en)</b>	dr. A.V. Belopolskiy
<b>Lesmethode(n)</b>	Hoorcollege
<b>Niveau</b>	500

### Doel vak

To extend students' knowledge in the field of cognitive and clinical neuroscience.

### Inhoud vak

Over the last two decennia, scientific research in the field of cognitive neuroscience has led to fundamental new insights in the relation between brain function and behavior. Research is ongoing, and in many cases, the latest insights have not yet traversed their ways down into the regular textbooks. This seminar offers students the possibility to discuss state of the art research. The latest insights into topics such as working memory, multisensory perception, and the mirror neuron system will be covered. The seminar will also cover important questions regarding legal and ethical aspects of cognitive and clinical neuroscience research.

### Onderwijsvorm

Lectures, literature study, oral presentations and discussions.

### Toetsvorm

Oral presentation, contribution to discussion, and a review paper.

### Literatuur

Research papers to be announced.

### Overige informatie

The requirement to participate is the completion of the basic Cognitive Neuroscience and Neuropsychology course. Alternatively, students may study the required literature by self- study. You need to contact the professor of Seminar Cognitive Neuroscience beforehand. Before you can enter the Seminar, you will need to pass an oral exam with the professor. Note that it is your own responsibility to contact the professor, study the literature and make an appointment for the oral exam.

## Serious Games

<b>Vakcode</b>	X_405097 ()
<b>Periode</b>	Periode 5
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	prof. dr. A.P.W. Eliens
<b>Examinator</b>	prof. dr. A.P.W. Eliens

<b>Docent(en)</b>	prof. dr. A.P.W. Eliens
<b>Lesmethode(n)</b>	Hoorcollege
<b>Niveau</b>	400

### Doel vak

Serious games are more and more considered to be an effective means to bring about awareness, acquire skills, change behavior, and influence social patterns. With elementary game development technology, the students will explore the potential of serious games in a social context, using casual game mechanics, and what recently has been identified as the dynamics of gamification.

### Inhoud vak

The course will cover the following topics:

- \* an introduction to game design
- \* practical skills in game development
- \* game mechanics and scoring mechanisms
- \* elementary game and utility theory
- \* media & communication theory
- \* game interaction patterns
- \* practical applications of serious games

Students are required to work in teams of 2-4 people, with as a goal the actual development of a serious game, with social network support.

### Onderwijsvorm

lectures and practicum

### Toetsvorm

essay and practicum assignment(s)

### Literatuur

online reference material(s)

### Aanbevolen voorkennis

preferably, but not obligatory, project interactive multimedia and multimedia authoring

### Doelgroep

choice for master students CS, IS, and others, with an interest in multimedia and game development

### Overige informatie

The course will be given in english. For information, see: [www.cs.vu.nl/~eliens/serious](http://www.cs.vu.nl/~eliens/serious)

## Service Oriented Design

<b>Vakcode</b>	X_405061 (405061)
<b>Periode</b>	Periode 1
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	dr. P. Lago
<b>Examinator</b>	dr. P. Lago
<b>Docent(en)</b>	dr. P. Lago

<b>Lesmethode(n)</b>	Hoorcollege, Werkcollege
<b>Niveau</b>	400

### Doel vak

Learn advanced design techniques applicable to large service-oriented software systems. Be able to select among them and apply them for a specific system. Be able to reason about and assess the design decisions.

### Inhoud vak

The lectures explain the concepts related to the Service Orientation software paradigm and Service Oriented Architecture (SOA).

The lectures provide the students with knowledge about how to identify the requirements for a service-oriented software system, how to map them on business services and transform them into complex networks of software services. Special emphasis is given to the design reasoning techniques for crucial decision making, service identification, SOA design and migration. Each year experts from academia and industry are invited to give guest lectures.

The students participate in small teams to piecemeal develop understanding of various service-oriented aspects, and work on an assigned SOA design project.

### Onderwijsvorm

Lectures and group work.

### Toetsvorm

Written reports of the assignments. Teamwork.

### Literatuur

Material handed out by the lecturer and on Blackboard.

### Aanbevolen voorkennis

Software modeling experience (knowledge of UML and SoaML preferred).  
Programming.

### Doelgroep

mAI, mCS, mIS

### Overige informatie

Registration for this course is compulsory four weeks prior to the start. Further information on this module will be made available on the Blackboard system <http://bb.vu.nl>.

## Software Architectuur

<b>Vakcode</b>	X_400170 (400170)
<b>Periode</b>	Periode 2
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Lesmethode(n)</b>	Hoorcollege
<b>Niveau</b>	400

**Doel vak**

Get acquainted with the field of software and information architecture. Understand the drivers behind architectural decisions. Be able to develop and reason about an architecture of a non-trivial system.

**Inhoud vak**

Students work in groups to develop an architecture for a fictitious system. They have to develop different representations (called views) of the architecture. These different representations emphasize different concerns of people that have a stake in the system. Each group will also be asked to assess ("test") the architecture of another group for certain quality attributes.

**Onderwijsvorm**

Group work with a number of assignments

**Literatuur**

Len Bass et al, Software Architecture in Practice, 3rd Edition, 2012

**Doelgroep**

mCS, mIS

## Software Testing

<b>Vakcode</b>	X_400439 (400439)
<b>Periode</b>	Periode 5
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	dr. N. Silvis-Cividjian
<b>Examinator</b>	dr. N. Silvis-Cividjian
<b>Docent(en)</b>	dr. N. Silvis-Cividjian
<b>Lesmethode(n)</b>	Hoorcollege, Practicum
<b>Niveau</b>	400

**Doel vak**

- Familiarization with basic terminology in software testing.
- Familiarization with techniques and tools used for test generation, execution and adequacy measurement.
- Familiarization with software testing literature in a specific area by independent reading of selected research publications.

**Inhoud vak**

Testing is a method to improve software quality. Realistically, software testing is a trade-off between budget, time and quality. It is impossible to test everything so choices have to be made. Students learn how to make these choices and systematically test a software product based only on its requirements or when the code is also available.

This course provides an introduction to software testing with an emphasis on technical activities like test generation, selection, execution and assessment. The course tries to answer a few questions like: How to design test cases? When to stop testing? What to

test when a new version of the product is ready? How to test a safety critical software? How to predict how many faults are in a program? During their practical assignments the students have to test small and large object-oriented software using the techniques learned in class and a set of testing tools.

A few guest lectures showing examples of testing in industry are also planned.

Topics: boundary value analysis, equivalence partitioning, model based test generation, control-flow testing, data-flow testing, mutation testing, regression testing, inspections, automated testing.

### Onderwijsvorm

Lectures and compulsory practical assignments.

### Toetsvorm

Practical assignments and written exam.

### Literatuur

A. Mathur, Foundations of software testing, Pearson Education, Addison-Wesley, 2008, \*ISBN: \* 978-8131716601

### Aanbevolen voorkennis

Programming skills in Java

### Doelgroep

mCS, mAI

### Overige informatie

All material is available in Blackboard. The course is taught in English.

## Spatial Criminology

<b>Vakcode</b>	R_SpaCrim (212416)
<b>Periode</b>	Periode 5
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Rechtsgeleerdheid
<b>Coördinator</b>	dr. J.J. van der Kemp
<b>Examinator</b>	dr. J.J. van der Kemp
<b>Lesmethode(n)</b>	Werkcollege
<b>Niveau</b>	600

### Doel vak

- (1) Students acquire knowlegde of the lastest theories and studies on the spatial distribution of crime;
- (2) Student are able to perform basic spatial criminological analyses as well as create crime map using freeware software like Qgis and CrimeStat;
- (3) Students are able to interpret and discuss results from spatial analyses.

### Inhoud vak

In this course the basic principles of Crime Mapping using a geographic information system (GIS) and spatial analyzes are taught. Mapping where crime takes place is the first step of the analysis of spatial distribution of crime. The relationship between theories and methods of spatial analysis are discussed.

For example, assuming that the spatial distribution of crime is associated with social cohesion. How this can be investigated and with which methods of spatial analysis can be used in this section is discussed. A number of different analytical methods are taught and practiced by assignments during the labs and during the final research project on a spatial crime problem.

#### Toetsvorm

To be announced

#### Literatuur

Literature is made available.

## Technology for Games

<b>Vakcode</b>	X_418146 ()
<b>Periode</b>	Periode 2
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen

#### Overige informatie

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

## The Social Web

<b>Vakcode</b>	X_405086 ()
<b>Periode</b>	Periode 4
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Exacte Wetenschappen
<b>Coördinator</b>	dr. L.M. Aroyo
<b>Examinator</b>	dr. L.M. Aroyo
<b>Docent(en)</b>	dr. L.M. Aroyo, V. Maccatrozzo MSc, C.R. Dijkshoorn MSc
<b>Lesmethode(n)</b>	Hoorcollege
<b>Niveau</b>	400

#### Doel vak

In this course the students will learn theory and methods concerning communication and interaction in a Web context. The focus is on distributed user data and devices in the context of the Social Web.

#### Inhoud vak

This course will cover theory, methods and techniques for:

- personalization for Web applications



- Web user & context modelling
- user-generated content and metadata
- multi-device interaction
- usage of social-web data

### Onderwijsvorm

- lectures
- practical sessions
- assignments including final paper

### Toetsvorm

Weighted average of assignments and final paper

### Literatuur

- course lecture slides
- selected articles, videos and Web links for each lecture

### Doelgroep

VU: mIS

UvA: master Information Studies - Human-Centered Multimedia

mCS

mAI

## Thinking and Deciding

<b>Vakcode</b>	P_MTHIDEC (815049)
<b>Periode</b>	Periode 2
<b>Credits</b>	6.0
<b>Voertaal</b>	Engels
<b>Faculteit</b>	Faculteit der Psychologie en Pedagogiek
<b>Coördinator</b>	dr. M. Meeter
<b>Examinator</b>	dr. M. Meeter
<b>Docent(en)</b>	L. Zwaan
<b>Lesmethode(n)</b>	Hoorcollege
<b>Niveau</b>	400

### Doel vak

Explaining and providing understanding of theories, research methods and practical aspects about human judgment, rational thinking, dilemmas and choices.

### Inhoud vak

Why do we make certain decisions? What is rational thinking, and what keeps us from it? How can we improve our thinking and decision processes? How do we reason and choose in uncertain (risk) situations? What is the influence of (moral) beliefs and emotions?

### Onderwijsvorm

Lectures, literature study, oral presentations and discussion.

### Toetsvorm

Oral presentation, contribution to discussion, and a review paper.

### Literatuur

## Veiligheid en burgerschap

<b>Vakcode</b>	S_VB ()
<b>Periode</b>	Periode 2
<b>Credits</b>	6.0
<b>Voertaal</b>	Nederlands
<b>Faculteit</b>	Faculteit der Sociale Wetenschappen
<b>Coördinator</b>	dr. R. van Steden
<b>Examinator</b>	dr. R. van Steden
<b>Docent(en)</b>	dr. R. van Steden, prof. dr. J.C.J. Boutellier
<b>Lesmethode(n)</b>	Hoorcollege, Werkgroep
<b>Niveau</b>	500

### Doel vak

In het seminar worden wetenschappelijke inzichten op het terrein van veiligheid en burgerschap zowel in de breedte als – op onderdelen – in de diepte behandeld. We richten ons daarbij op sociale (on)veiligheid in objectieve en subjectieve zin binnen de context van een netwerksamenleving. Een belangrijke vraag is wat het begrip veiligheid inhoudt en waarom veiligheid een zo belangrijke rol in onze samenleving is gaan spelen. Daarbij plaatsen we het thema veiligheid tegen de achtergrond van publieke moraal in de vorm van discussies over normen, waarden, maatschappelijke verzuim en een (dreigende) controlecultuur. Voorts spitst het seminar zich toe op de organisatie van veiligheid – dat wil zeggen: de (verschuivende) relaties tussen overheidsorganisaties, het bedrijfsleven en maatschappelijke instituties. Ook wordt de rol van burgers in lokale veiligheidsnetwerken onder de loep genomen. Kunnen veiligheidsnetwerken burgerschap ondersteunen, ondermijnen of constitueren?

### Inhoud vak

Het programma biedt studenten kennis over de volgende thematieken:

- Sociale (on)veiligheid;
- Criminogeniteit en strafrecht;
- Veiligheid en publieke moraal;
- Veiligheidsbeleving en veiligheidsbeleid;
- Veiligheidsnetwerken en 'nodale orde';
- Veiligheid en burgerparticipatie;
- Maatschappelijke gevolgen van het huidige veiligheidsstreven.

Aan het eind van de cursus moeten studenten een heldere link kunnen leggen met meer algemene bestuurskundige theorievorming. Ook moeten zij dan kritisch kunnen reflecteren op (mogelijke) maatschappelijke gevolgen van de huidige hang naar veiligheid.

### Onderwijsvorm

Hoor- en werkcolleges met verplichte aanwezigheid.

### Toetsvorm

Tentamen

### Literatuur

Wordt nog bekend gemaakt.

**Aanbevolen voorkennis**

Leestip: Boorsma, J.S.W. & Tjihuis, A.J.G. (2008). Actoren in de strafrechtspleging: een inleiding. Den Haag: Boom Juridische Uitgevers.

**Doelgroep**

Masterstudenten Bestuurskunde, afstudeerrichting BvV