Artificial Intelligence MSc

Vrije Universiteit Amsterdam - Faculteit der Exacte Wetenschappen - M Artificial Intelligence - 2017-2018

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 varience 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: 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.

More information
- All compulsory courses and electives you find in the year schedule;
- A complete description of the programme you find in the Teaching and Examination Regulations;
- For more information about the programma you can contact the academic advisor (VU students only);
- As a VU student you need to register for all courses via VUnet. Only after you completed your enrollment for the study programme you can register for courses;
- More information on all the courses you find through the links below.

Inhoudsopgave

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 progamme 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:

- M Artificial Intelligence track Cognitive Science recommended electives
- Constrained Choice Data Analysis
- Constrained Choice

Vakken:

Naam	Periode	Credits	Code
Brain Imaging	Periode 4	6.0	P_MBRIMAG
Interdisciplinary Research Methodology for IS	Periode 2	6.0	X_405085
Knowledge Engineering	Periode 2	6.0	X_405099
Machine Learning for the Quantified Self	Periode 6	6.0	XM_40012
Model-based Intelligent Environments	Periode 5	6.0	X_405056
Neural Models of Cognitive Processes	Periode 2	6.0	P_MNEUMOD
Seminar Cognitive Neuroscience	Periode 1	6.0	P_MSEMCNS

M Artificial Intelligence track Cognitive Science recommended electives

Vakken:

Naam	Periode	Credits	Code
Agent Systems	Periode 4	6.0	XMU_405123
Behaviour Dynamics in Social Networks	Periode 2	6.0	X_400113
History of digital cultures	Periode 3	6.0	XMU_418107
ICT4D in the field	Periode 6	6.0	XM_0008
ICT4D: Information and communication technology for Development	Periode 5	6.0	X_405101
Internet programming	Periode 1	6.0	X_405082
Memory and Memory Disorders		6.0	P_MMEMORY
Mini-Master Project AI	Ac. Jaar (september)	6.0	XM_400428
Review Paper	Ac. Jaar (september)	6.0	P_MREVPAP
Seminar Attention	Periode 5	6.0	P_MSEMATT
Watson Innovation	Periode 2	6.0	X_405129

Constrained Choice Data Analysis

Vakken:

Naam	Periode	Credits	Code
Advanced Data Analysis	Periode 1	6.0	P_MADVDAT
Experimental Design and Data Analysis	Periode 4	6.0	X_405078

Constrained Choice

Vakken:

Naam	Periode	Credits	Code
Master Project	Ac. Jaar (september)	30.0	X_400285
Master Thesis: Research Project Cognitive Science	Ac. Jaar (september)	30.0	P_MTHRCSC

Socially Aware Computing

Opleidingsdelen:

- Artificial Intelligence
- Criminology
- Health Sciences
- Information Sciences
- Bewegingswetenschappen
- Psychology
- Constrained Choice Data Analysis

Vakken:

Naam	Periode	Credits	Code
Agent Systems	Periode 4	6.0	XMU_405123
Behaviour Dynamics in Social Networks	Periode 2	6.0	X_400113
Cognitive Psychology and its Applications	Periode 1	6.0	XM_40010
Intelligent Interactive Systems	Periode 1	6.0	XMU_418023
Knowledge Engineering	Periode 2	6.0	X_405099
Knowledge Representation on the Web	Periode 5	6.0	XMU_418169
Machine Learning for the Quantified Self	Periode 6	6.0	XM_40012
Master Project	Ac. Jaar (september)	30.0	X_400285

Artificial Intelligence

Vakken:

Naam	Periode	Credits	Code
Advanced Logic	Periode 4	6.0	X_405048
Computational Intelligence	Periode 2	6.0	XM_417015
Data Mining Techniques	Periode 5	6.0	X_400108
Evolutionary Computing	Periode 1	6.0	X_400111
ICT4D in the field	Periode 6	6.0	XM_0008
ICT4D: Information and communication technology for Development	Periode 5	6.0	X_405101
Literature Study and Seminar	Ac. Jaar (september)	6.0	X_405111
Mini-Master Project AI	Ac. Jaar (september)	6.0	XM_400428
The Social Web	Periode 4	6.0	X_405086

Criminology

Vakken:

Naam	Periode	Credits	Code
Misdaadanalyse en daderprofilering	Periode 4	6.0	R_Misd.anaC
Spatial Criminology	Periode 5	6.0	R_SpaCrim

Health Sciences

Vakken:

Naam	Periode	Credits	Code
Health Promotion and Disease Prevention	Periode 2	6.0	AM_470811
Health Psychology	Periode 2	6.0	AM_470730
Prevention of Mental Health Problems	Periode 3	6.0	AM_470840

Information Sciences

Vakken:

Naam	Periode	Credits	Code
History of digital cultures	Periode 3	6.0	XMU_418107
Information Retrieval 1	Periode 3	6.0	XMU_418043
Knowledge and Media	Periode 1	6.0	X_405065
Psychology of Effective Gaming	Periode 1	6.0	XMU_418145
Technology for Games	Periode 2	6.0	XMU_418146

Bewegingswetenschappen

Vakken:

Naam	Periode	Credits	Code
Coordination Dynamics: principles and applications	Periode 2	6.0	B_CLINCORDYN
Dynamica van Lineaire Systemen	Periode 1	3.0	B_DYNAMICA
Energy Flow Models	Periode 1	3.0	B_ENERFLOW
Perception for Action	Periode 4	3.0	B_PERCACTION

Psychology

Vakken:

Naam	Periode	Credits	Code
Aging and Dementia	Periode 2+3	6.0	P_MAGINGD
Brain Imaging	Periode 4	6.0	P_MBRIMAG
Memory and Memory Disorders		6.0	P_MMEMORY
Neural Models of Cognitive Processes	Periode 2	6.0	P_MNEUMOD
Seminar Attention	Periode 5	6.0	P_MSEMATT
Seminar Cognitive Neuroscience	Periode 1	6.0	P_MSEMCNS

Constrained Choice Data Analysis

Vakken:

Naam	Periode	Credits	Code
Advanced Data Analysis	Periode 1	6.0	P_MADVDAT
Experimental Design and Data Analysis	Periode 4	6.0	X_405078

Advanced Data Analysis

Vakcode	P_MADVDAT (815033)
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Coördinator	dr. J.W. van Prooijen
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak
This course provides a theoretical overview and detailed practical knowledge concerning statistical analyses of 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
Exam 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 Logic

Vakcode	X_405048 (405048)
Periode	Periode 4
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. F. van Raamsdonk
Examinator	dr. F. van Raamsdonk
Docent(en)	dr. F. van Raamsdonk
Lesmethode(n)	Hoorcollege, Werkcollege, Deeltoets extra zaalcapaciteit
Niveau	500

Doel vak
The objective of the course Advanced Logic 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: for example 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 Logic and Modelling
or an equivalent introduction to first-order logic.

Doelgroep
mAI, mCS, mPDCS

Uitleg in Blackboard/Canvas
The information about Advanced Logic is shared via the webpage of the course http://www.cs.vu.nl/~tcs/al.

Intekenprocedure
Registration is organized in the standard way.

Agent Systems

Vakcode	XMU_405123 ()
Periode	Periode 4
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M.C.A. Klein
Examinator	dr. M.C.A. Klein
Docent(en)	dr. M.C.A. Klein
Lesmethode(n)	Hoorcollege, Computerpracticum
Niveau	400

Inhoud vak
http://studiegids.uva.nl/xmlpages/page/2017-2018/zoek-vak/vak/39202

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

Aging and Dementia

Vakcode	P_MAGINGD (815181)
Periode	Periode 2+3
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Gedrags- en Bewegingswetensch.
Coördinator	prof. dr. E.J.A. Scherder
Examinator	prof. dr. E.J.A. Scherder
Docent(en)	prof. dr. E.J.A. Scherder
Lesmethode(n)	Hoorcollege
Niveau	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 or mc questions

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

Behaviour Dynamics in Social Networks

Vakcode	X_400113 (400113)
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. J. Treur
Examinator	prof. dr. J. Treur
Docent(en)	prof. dr. J. Treur
Lesmethode(n)	Hoorcollege, Practicum
Niveau	400

Doel vak
To learn how to identify different types of mental and social processes; to understand how individual and social behaviour emerges from mechanisms known from Cognitive, Affective and Social Neuroscience, and from Cognitive and Social Sciences; to be able to construct network models for mental and social interaction processes; to perform analysis based on these models using Network-Oriented Modeling software tools and empirical data.

Inhoud vak
This course is a multidisciplinary course, also accessible for students from other disciplines such as Neuroscience, Psychology or Social Sciences. Behaviour dynamics occurs in different forms, contexts and complexity. Complexity can occur in the mental processes within persons or in social interaction processes, or in both. Both types of processes can be adaptive: mental processes can change due to learning, and social interactions can also evolve over time. Theories and findings from Cognitive, Affective and Social Neuroscience and also from Cognitive and Social Sciences are presented and used to get insight in the underlying mechanisms that form a solid scientific basis for modelling of these processes. In the course a Network-Oriented Modeling approach based on temporal-causal networks is used to model both these internal mental processes (as networks of mental states) and social interaction processes (as social networks). During the course several examples are

studied. These examples cover imagination and dreaming by internal simulation, integration of emotions in all kinds of mental and social processes, learning of emotion regulation, ownership and attribution of actions, empathic social responses, empathic joint decision making, development of shared understanding and collective action, and different principles for evolving social networks.
The dynamics of such processes is modeled, simulated and analysed (including verification and validation) in this course using dedicated and easy to use modelling environments for Network-Oriented Modeling; no programming is needed. In the last few weeks of the course a more ambitious final assignment is addressed, which can be worked out to a paper that may be submitted to an international conference where it could be presented and provide a publication.

Onderwijsvorm
Combinations of lectures and practical assignments.

Toetsvorm
Practical assignments and a final assignment.
Presentation of the final assignment

Literatuur
Treur, J., Network-Oriented Modeling: Addressing Complexity of Cognitive, Affective and Social Interactions. Series on Understanding Complex Systems, Springer Publishers, October 2016.
URL: http://www.springer.com/gp/book/9783319452111#aboutBook
Free downloadable from the VU at doi:
http://dx.doi.org/10.1007/978-3-319-45213-5
Table of Contents: http://www.few.vu.nl/~treur/cve/Papers/NOMToC.pdf

Aanbevolen voorkennis
None

Doelgroep
mAI and multidisciplinary master studies from Psychology, Neuroscience and
Social Sciences

Brain Imaging

Vakcode	P_MBRIMAG (815103)
Periode	Periode 4
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Gedrags- en Bewegingswetensch.
Coördinator	dr. T.H.J. Knapen
Examinator	dr. T.H.J. Knapen
Docent(en)	dr. T.H.J. Knapen, D.M. van Es MSc
Lesmethode(n)	Hoorcollege, Werkcollege
Niveau	400

Doel vak
Students will learn to analyse and interpret imaging data from different modalities, such as fMRI and EEG. Emphasis will be placed on the analysis of imaging data as time series, and practical examples will

focus on fMRI.

Inhoud vak
Treatment of the mathematical and physical concepts of the different recording techniques, among which basic linear algebra, Fourier analysis and GLM.
Students will learn to programmatically analyse data using Python. Standard GLM analysis for fMRI is conducted using FSL.
Half of the course will be practicals in which students will gain hands-on experience with EEG and fMRI data analysis using open-source tools.
Each student will be required to write a research proposal at the end of the course.

Onderwijsvorm
Class teaching, Practicals, Research proposal

Toetsvorm
Final Exam, open-end questions 40%
Practical assignments 40%
Research Proposal 20%

Literatuur
Handbook of Functional MRI Data Analysis, Poldrack et al, Cambridge press.

Overige informatie
Prior knowledge of Python programming and statistics is recommended.

Cognitive Psychology and its Applications

Vakcode	XM_40010 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. A.V. Belopolskiy
Examinator	dr. A.V. Belopolskiy
Docent(en)	dr. A.V. Belopolskiy
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak
The course aims to provide an overview of cognitive psychology and its applications

Inhoud vak
The course covers a number of central principles from the area of cognitive psychology and how these principles can be applied in the design of modern man-machine systems including human-computer systems. A variety of topics will be discussed such as mental workload, decision-making, driving behavior, route finding, medical decision-making and display design. The students will understand the role of human cognitive capabilities and limitations in the design of products, work places, and large systems. They will get acquainted with main areas of human factors and with main theories and findings on human performance. They

will understand where in the process to apply knowledge and what methods can be used to analyze human performance. They will also learn how to approach and solve an applied problem in man-machine systems.

Onderwijsvorm
Lectures (~18 hours) and practical assignments (~6 hours)

Toetsvorm
Practical research assignment (50%), Open-end exam (50%). These evaluations are independent from each other and cannot be used to compensate for one another. An improved version of the research assignment can be used for re-examination. A resit is needed for the open-end exam. These components can be re-examined separately.

Literatuur
An introduction to Human Factors Engineering (2013) by Wickens et al.

Doelgroep
The course Cognitive Psychology and its Applications will be part of the new RM Socially Aware Computing (FEW)

Overige informatie
The course Cognitive Psychology and its Applications is a core course in the newly developed RM Socially Aware Artificial Intelligence (AI, FEW) which will start 2016/2017. Two core qualifications of a graduate with a Master Diploma in Socially Aware Artificial Intelligence are: -"Has basic knowledge of physiological, psychological, or social aspects of human functioning that can be exploited in Socially Aware Artificially Intelligent systems." -"Has in-depth knowledge, insight and skills in at least one area of the human-oriented disciplines, e.g. Clinical and Cognitive Psychology, Social Sciences, Movement Sciences, Criminology, or Medicine." The course Cognitive Psychology and its Applications contributes to these two qualifications.

Computational Intelligence

Vakcode	XM_417015 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M. Hoogendoorn
Examinator	dr. M. Hoogendoorn
Lesmethode(n)	Hoorcollege, Computerpracticum
Niveau	400

Doel vak
The overall aim of this course is to provide knowledge about concepts, theory, and techniques used in computational intelligence and the know-how to employ these for making intelligent machines. In particular, to enable students to:
- gain profound understanding of fundamental computational intelligence concepts, algorithms, and their implementation;
- understand the theoretical background of proposed solutions;
- develop skills in the use of computational intelligence and to

demonstrate this in physical robots or virtual creatures;
- appreciate relevant current research topics in the theory and practice of computational intelligence.

Inhoud vak
Computational intelligence can be positioned as the research area that follows a bottom-up approach to developing systems that exhibit intelligent behavior in complex environments. It is often contrasted to the top-down approach followed by traditional artificial intelligence. Typically, sub-symbolic and nature-inspired methods are adopted that tolerate incomplete, imprecise and uncertain knowledge. As a consequence, the resulting approaches allow for approximate, manageable, robust and resource-efcient solutions.

This course covers nature-inspired techniques such as neural networks, evolutionary algorithms and swarm intelligence. Special attention is paid to using such techniques for making autonomous and adaptive machines.

Onderwijsvorm
Lectures
Presentation/symposium
Working independently on the project
Supervision/feedback meeting

Toetsvorm
Average of written exam (50%) and a programming assignment (50%). Both sub-grades must be sufficient.

Literatuur
Literature: Slides and scientific papers
Other: Additional papers will be made available.

Coordination Dynamics: principles and applications

Vakcode	B_CLINCORDYN (900666)
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Gedrags- en Bewegingswetensch.
Coördinator	dr. M. Roerdink
Examinator	dr. M. Roerdink
Docent(en)	dr. M. Roerdink
Lesmethode(n)	Hoorcollege, Computerpracticum, Practicum, Bijeenkomst, Deeltoets extra zaalcapaciteit
Niveau	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.

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
Optional Midterm Exam: 1 * 1.75 hrs
Final Exam: 2.75 hrs

Self study: 132 hrs

Toetsvorm
Two written closed-book exams with open-ended questions (optional mid-term exam and compulsory final exam). The final grade is established with an accuracy of 0.5 and is determined by the optional midterm exam (50%) and the final exam (50%). However, in case the grade of the optional midterm exam is lower than that of the compulsory final exam, only the grade obtained for the Final Exam will count (i.e., Midterm Exam [0%], Final Exam [100%]). The same holds for students who did not complete the midterm exam.

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).

Data Mining Techniques

Vakcode	X_400108 (400108)
Periode	Periode 5
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M. Hoogendoorn
Examinator	dr. M. Hoogendoorn
Docent(en)	dr. M. Hoogendoorn
Lesmethode(n)	Hoorcollege
Niveau	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 (h) and compulsory practical work (pra). 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). For the regular assignments the first assignment counts for 40% and the second for 60%. The grade of both assignments needs to be sufficient to pass the course.

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

Doelgroep
mBA, mCS, mAI, mBio

Dynamica van Lineaire Systemen

Vakcode	B_DYNAMICA (900314)
Periode	Periode 1
Credits	3.0
Voertaal	Nederlands
Faculteit	Fac. der Gedrags- en Bewegingswetensch.
Coördinator	dr. R.J. van Beers
Examinator	dr. R.J. van Beers
Docent(en)	dr. R.J. van Beers
Lesmethode(n)	Hoorcollege, Computerpracticum
Niveau	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 lineaire 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).

Vereiste 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.

Aanbevolen 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.

Overige informatie
Deze cursus maakt deel uit van de minor BWSB. Het wordt aanbevolen om dit vak te volgen in combinatie met het vak Simulatiemodellen van skeletsystemen.

Energy Flow Models

Vakcode	B_ENERFLOW (900675)
Periode	Periode 1
Credits	3.0
Voertaal	Engels
Faculteit	Fac. der Gedrags- en Bewegingswetensch.
Coördinator	dr. J.J. de Koning
Examinator	dr. J.J. de Koning
Docent(en)	dr. J.J. de Koning
Lesmethode(n)	Hoorcollege, Computerpracticum
Niveau	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 Canvas.

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)

Intekenprocedure
For more info on workgroups, laboratories, (computer) practicals etc. please see Canvas.

Evolutionary Computing

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

Doel vak
This course has a threefold objective: 1) To learn about computational methods based on Darwinian principles of evolution. 2) To illustrate the usage of such methods as problem solvers and as simulation tools. 3) To gain hands-on experience in performing computational experiments with evolutionary algorithms.

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, evolution strategies, evolutionary programming, genetic programming). 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 Java programming assignment (in teams of 3). Highly motivated students can replace the programming assignment by a special research track under the personal supervision of the lecturer(s). These research projects aim at publications.

Toetsvorm
Written exam and programming assignment (weighted average). To pass the course as a whole, you must pass both the exam and the programming assignment.

Literatuur
Eiben, A.E., Smith, J.E., Introduction to Evolutionary Computing. Springer, 2015, 2nd edition, ISBN 978-3-662-44873-1.

Vereiste voorkennis
Java programming skills are necessary to do the practical assignment.

Doelgroep
mBA, mAI, mCS, mPDCS

Experimental Design and Data Analysis

Vakcode	X_405078 ()
Periode	Periode 4
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. E.N. Belitser
Examinator	dr. E.N. Belitser
Docent(en)	dr. E.N. Belitser
Lesmethode(n)	Hoorcollege, Practicum
Niveau	400

Doel vak
In this course the student will get acquainted with the most common experimental designs and regression models, nonparametric

tests and bootstrap methods will be discussed. On completion of this course the student should be 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 be 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 using the statistical package R.

Onderwijsvorm
Lectures, discussions of the assignments.

Toetsvorm
Several practical assignments during the course and the final assignment at the end. The final grade is based on the written reports of all these assignments.

Literatuur
- Slides of the lectures,
- R manual.

An introductory book on statistics (containing the prerequisite knowledge for this course) is for example
- Statistical reasoning for everyday life, by J.O. Bennett, W. Briggs, M.F.Triola.

For more background on the topics in this course, the following books are recommended:
- Linear models with R, by J.J. Faraway (emphasis on the implementation in R);
- Extending the linear model with R, by J.J. Faraway (emphasis on the implementation in R);
- A first course in the design of experiments; a linear models approach, by D.C. Weber and J.H. Skillings (with the emphasis on the designs and the implementation in SAS).

Vereiste voorkennis
Introductory statistics.

Aanbevolen voorkennis

Probability and statistics courses.

Doelgroep
mAI, mCS

Overige informatie
All assignments are to be solved using the statistical package R (http://www.r-project.org/).

Health Promotion and Disease Prevention

Vakcode	AM_470811 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. M.C. Adriaanse
Examinator	dr. M.C. Adriaanse
Docent(en)	dr. M.C. Adriaanse, prof. dr. I.H.M. Steenhuis, dr. W. Kroeze
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	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.

• 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 in Nov-Dec 2016. Health Promotion and Disease Prevention 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, 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.
Bartholomew, Eldredge, Parcel, Kok, Gottlieb, Fernandez (eds) Planning health
promotion programs: an intervention mapping approach; fourth edition(2016). Jossey-Bass,
San Fransisco. ISBN:978-1-119-03549-7
Chapters which are applicable to this course will be announced through Canvas.
In addition, students will use a course manual, and additional course materials are provided via Canvas.

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 Canvas; obligated 1 week before the start of the course.

Overige informatie
This course is compulsory within the Master specialization Prevention & public health.The following courses of the Bachelor health sciences are strongly recommended: 'Preventie' and 'Gezondheidscommunicatie'.

Health Psychology

Vakcode	AM_470730 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	B.A. van der Wende MSc
Examinator	prof. dr. I.H.M. Steenhuis
Docent(en)	prof. dr. I.H.M. Steenhuis
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	400

Doel vak
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. Health Psychology is a part-time course, this means that 21 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 session.

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,

4rd Edition, by L. Kay Bartholomew, Guy S. Parcel, Gerjo Kok, Nell H. Gottlieb, Maria E. Fernandez. March 2016, 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.

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

Vakcode	XMU_418107 ()
Periode	Periode 3
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	O.W. Schrofer
Examinator	O.W. Schrofer
Niveau	400

Inhoud vak
http://studiegids.uva.nl/xmlpages/page/2017-2018/zoek-vak/vak/28352

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

ICT4D in the field

Vakcode	XM_0008 ()
Periode	Periode 6
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. J. Gordijn
Examinator	drs. A. Bon
Niveau	400

ICT4D: Information and communication technology for Development

Vakcode	X_405101 ()
Periode	Periode 5
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. V. de Boer
Examinator	dr. V. de Boer
Docent(en)	dr. K.S. Schlobach, drs. A. Bon, dr. V. de Boer
Lesmethode(n)	Hoorcollege, Werkcollege
Niveau	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
This course gives an introduction to the relatively new field of ICT4D and will be given jointly by experts from the Department of Computer Science (CS) and the Center for International Cooperation (CIS) with lecturers from both backgrounds who will focus on their areas of expertise.

In the course we will give an overview over methodology, technology and

the social dimension of the usage of Information Technology in the context of Development. We will introduce a general framework for ICT4Development. Subsequently, lecturers from CIS will teach you how to analyse a development problem and introduce the analytical methods required for an indepth understanding of a potential development support project. Lecturers from CS will provide some initial technological knowledge required for running an ICT project in a developing country, such as Voice technology or database technology on small, inexpensive, hardware. 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.

In lectures, you will first be introduced to a number of tools, techniques and programming languages that can be used for ICT4D projects. We will introduce case studies, highlight real-world ICT4D projects, both from inside and outside academia. We will discuss requirements and strategies used in the projects. We will present a number of initiatives in which the VU is involved in. To prepare for the lectures, you will read related literature provided by the lecturers.

In the tutorial lectures, students will first get familiar with the tools and techniques introduced in the practical lectures. We will assess your skills in assignments.

Onderwijsvorm
The course will be a combination of lectures and project work.

Toetsvorm
Practical assignment

Literatuur
Collection of papers.

Doelgroep
mAI, mCS, mIS

Information Retrieval 1

Vakcode	XMU_418043 (418043)
Periode	Periode 3
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Niveau	500

Inhoud vak
http://studiegids.uva.nl/xmlpages/page/2017-2018/zoek-vak/vak/34035

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

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

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

Intelligent Interactive Systems

Vakcode	XMU_418023 (418023)
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Niveau	400

Inhoud vak
http://studiegids.uva.nl/xmlpages/page/2017-2018/zoek-vak/vak/33231

Doelgroep
mIS

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

Interdisciplinary Research Methodology for IS

Vakcode	X_405085 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. G.C. van de Weerd
Examinator	dr. G.C. van de Weerd
Docent(en)	dr. G.C. van de Weerd
Lesmethode(n)	Hoorcollege
Niveau	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 formulate a research design containing appropriate research questions and how they are answered through applicable research methods, the latter covering qualitative, quantitative and constructive methodologies typical to the IS field;
• is able to argue for his/her research design with solid argumentation explaining the underlying assumptions, pros and cons etc. of the chosen methods;
• knows the different ways to collect and analyse research data according to the different IS research methodologies and how to critically judge the obtained results in relation to the research

questions.

Inhoud vak
This course helps to advance your knowledge of how to design and carry out high-quality scientific research in the domain of information systems and technologies. This course will guide you through the different stages of carrying out a research project, from conducting a literature review, developing a research design, to collecting and analysing data, and writing the findings and discussion section.

Onderwijsvorm
Lectures and interactive discussions.

Toetsvorm
Individual and team-based assignments.

Literatuur
To be announced.

Vereiste voorkennis
Basic knowledge of qualitative and quantitative research methods.

Doelgroep
mAI, mIS

Internet programming

Vakcode	X_405082 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. ir. M.X. Makkes
Examinator	dr. ir. M.X. Makkes
Docent(en)	dr. ir. M.X. Makkes
Lesmethode(n)	Hoorcollege
Niveau	400

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

Vakcode	X_405065 (405065)
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. T. Kuhn MSc
Examinator	dr. T. Kuhn MSc
Docent(en)	dr. T. Kuhn MSc
Lesmethode(n)	Werkcollege
Niveau	500

Doel vak
The goal of the course is to provide high-level insights in the concepts of information organization, knowledge representation, and knowledge processes in relation to ICT-based media.

Inhoud vak
This course covers the general principles and methods that form the foundation of information organization and knowledge-intensive processes, and puts them in relation to 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 media will be explored, and various types of applications will be discussed.

Onderwijsvorm
Working lectures

Toetsvorm
Portfolio

Literatuur
Articles announced through Canvas

Knowledge Engineering

Vakcode	X_405099 ()
Periode	Periode 2

Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. A.C.M. ten Teije
Examinator	dr. A.C.M. ten Teije
Docent(en)	dr. A.C.M. ten Teije
Lesmethode(n)	Hoorcollege
Niveau	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

Knowledge Representation on the Web

Vakcode	XMU_418169 ()
Periode	Periode 5

Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. K.S. Schlobach
Lesmethode(n)	Hoorcollege, Onderwijs

Inhoud vak
http://studiegids.uva.nl/xmlpages/page/2017-2018/zoek-vak/vak/29579

Intekenprocedure
Registration is required via https://www.sis.uva.nl before the start of the semester.

Literature Study and Seminar

Vakcode	X_405111 ()
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. P. Lago
Examinator	prof. dr. P. Lago
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak
After taking this course, students will be able to:
- design a sound desk research based on scientific literature and identify the relevant literature related to the target research; or perform an in-depth study of a selected set of literature sources;
- criticize, analyze, and discuss scientific literature;
- reflect on the in-depth knowledge gained during the course on the selected literature study topic.

Inhoud vak
The course consists of carrying out a literature study on a topic chosen in agreement with the selected tutor.

The ‘theoretical preparation’ of the course consists of studying the provided material on literature study design, where the student learns how to go from a research question to a well-structured analysis of the literature. This step can be carried out by translating the research question into a sound search query, identifying adequate on-line literature search engines, and performing a motivated selection of the literature for further analysis; or alternatively by selecting, together with the tutor, a set of relevant literature and performing an in-depth study.

The actual literature study starts with the 'exploration phase' in which the student must identify a topic of interest or a course particularly appreciated. He or she will then contact the person in charge of the identified research area/course and discuss with him/her the possibility to carry out a literature study under his/her supervision.

In general, the literature study will be either predominantly broad, leading to a literature survey on the selected theme, or deep, carving out the intricacies of a specific topic. The outcome of the literature study is a final report, which must include: study design; overview of selected literature; analysis of the literature; discussion and conclusions. At the end of this phase, the student gives one final presentation to the research group of the tutor. This presentation includes research questions, study design, study execution, and discussion of analysis.

Onderwijsvorm
Individual assignment.

Toetsvorm
Final report (V). Final presentation (pre).

Grading criteria: quality of study design; rationale for literature selection (if applicable); quality of results (quality of writing, scientific quality of the analysis, discussion of the findings, reflection in the drawn conclusions, clear answer to main research question); quality of technical report (style, clarity, organization); correctness and completeness of references and citations; final presentation to the research group where he/she carries out the literature study.

Literatuur
Material on literature study design is online at
https://wiki.cs.vu.nl/mp/index.php/LSresources

Doelgroep
mCS

Overige informatie
The student should look for a tutor in the area he or she would like to carry out the literature study. See online material (Course reading) for further information. Tutors can be chosen among the staff members of the CS Department.

Machine Learning for the Quantified Self

Vakcode	XM_40012 ()
Periode	Periode 6
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M. Hoogendoorn
Examinator	dr. M. Hoogendoorn
Lesmethode(n)	Hoorcollege, Practicum
Niveau	400

Doel vak
The quantified-self refers to large-scale data collection of a user's behavior and context via a range of sensory devices, including smart phones, smart watches, ambient sensors, etc. These measurements contain

a wealth of information that can be extracted by means of machine learning techniques, for instance for the purpose of predictive modeling. In addition, machine learning techniques can be a driver for adaptive systems to support users in a personalized way based on the aforementioned measurements. The type of data does however require specialized machine learning techniques to fully exploit the information contained in the data. Examples of challenges include the temporal nature of the data, the variety in the type of data, the different granularity of various sensors, noise, etcetera. The main aims of this course are to:
* Understand the challenges imposed by quantified-self data upon machine learning techniques.
* Become familiar with machine learning techniques for predictive modeling that are able to cope with these challenges.
* Become familiar with machine learning techniques that drive adaptive feedback and support.
* Understand how different machine learning approaches can be united in a single system.
The student should become familiar with the more theoretical side of the domain and the current state-of-the-art in research. In addition, the student will learn how to apply this knowledge in a practical setting.

Inhoud vak
The course will provide an overview of relevant state-of-the-art machine learning techniques. More in specific, it will address:
• Feature engineering (how do we come from raw data to usable features):
* Removing noise from data
* Handling missing data
* Identifying (temporal) features
• Learning of user patterns:
* Temporal machine learning approaches such as recurrent neural networks, time series analysis
* Clustering approaches with dedicated distance metrics (including dynamic time warping)
• Adaptive feedback and support
* Reinforcement learning
• Integration of the various components.
In addition, a number of real-life applications will be discussed. Next to lectures, there will be an extensive practical part, where students will learn to work with various algorithms and data sets. As a final assignment, the students will develop a mobile-based system which incorporates several techniques treated during the lecture.

Onderwijsvorm
The course will be taught in four weeks. During the first two weeks the emphasis will be on lectures (l) and assignments associated with the material covered in the lectures. These assignments will form the basis for the final assignment, which is a project (pro) to build a data-driven intelligent system for the quantified self.

Toetsvorm
Written exam (E) (50%) and practical assignments (A) (50%). For both parts the grade needs to be sufficient to obtain a final grade. For the practical assignments the final assignment counts for 60% while the smaller assignments associated with the lectures count for 40% in total.

Literatuur
Papers and reader, made available via Canvas.

Aanbevolen voorkennis
Programming experience. Knowledge of basic machine learning algorithms.

Doelgroep
XM_AI, XM_BA, XM_CS

Overige informatie
Lecturer:
Dr.M. Hoogendoorn

Master Project

Vakcode	X_400285 (400285)
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M. Hoogendoorn
Lesmethode(n)	Hoorcollege
Niveau	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 Middag). See canvas.

Onderwijsvorm
The Master Project must always 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 Master project pages on canvas (inclusive
the "Manual for the Master Project AI") and http://wiki.cs.vu.nl/mp

Master Thesis: Research Project Cognitive Science

Vakcode	P_MTHRCSC (815067)
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Fac. der Gedrags- en Bewegingswetensch.
Coördinator	prof. dr. J.L. Theeuwes
Examinator	prof. dr. J.L. Theeuwes
Niveau	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

Vakcode	P_MMEMORY (815102)
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Gedrags- en Bewegingswetensch.
Coördinator	dr. R.J. Godijn
Examinator	dr. R.J. Godijn
Docent(en)	dr. R.J. Godijn
Lesmethode(n)	Hoorcollege
Niveau	400

Literatuur
Various papers, to be announced via Canvas.

Mini-Master Project AI

Vakcode	XM_400428 (400428)
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M. Hoogendoorn
Examinator	dr. M. Hoogendoorn
Niveau	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).

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

Vakcode	R_Misd.anaC (212404)
Periode	Periode 4
Credits	6.0
Voertaal	Nederlands
Faculteit	Faculteit der Rechtsgeleerdheid
Coördinator	dr. J.J. van der Kemp
Examinator	dr. J.J. van der Kemp
Docent(en)	dr. J.J. van der Kemp
Lesmethode(n)	Hoorcollege, Werkcollege
Niveau	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.
De methoden en technieken van Misdaadanalyse en Daderprofilering komen ook terug in het analyseren van interventies, bijv. een gebiedsgebondenaanpak van de politie, of het analyseren van delictscenario's bij de behandeling van TBS-ers.
Een selectie van methoden van misdaadanalyse en daderprofilering komt aan bod en worden deze voorzien van wetenschappelijke reflectie. Achtereenvolgens zullen strategische analyses vanuit probleemgestuurd (POP-policing) perspectief en geografische analyses als Hot Spots worden besproken. 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 en interventie van criminaliteit, alsmede bij het ontwikkelen van beleid door politie, justitie, het openbaar bestuur en de beveiligingsindustrie.

Toetsvorm
Nader bekend te maken via Canvas.

Literatuur
Nader bekend te maken via Canvas

Vereiste voorkennis
De voorkennis die is vereist voor de Master Opsporingscriminologie: misdaadprofielen en misdaadbestrijding
geldt als vereiste voorkennis voor het vak Misdaadanalyse en Daderprofilering.

De kennis wordt gedefinieerd als de stof beheersen en kunnen toepassen van de boeken:
Dijk, J.J.M. van, W. Huisman & P. Nieuwbeerta (2014) Actuele criminologie (8e druk) Den Haag: Sdu Uitgevers.
Bijleveld, C.C.J.H. (2013) Methoden en Technieken van onderzoek in de Criminologie (5e druk) Den Haag: Boom Juridische uitgevers.
Kronenberg, M. en B. de Wilde (2015) Grondtrekken van het Nederlandse Strafrecht (6e druk) Den Haag: WoltersKluwer.

Model-based Intelligent Environments

Vakcode	X_405056 (405056)
Periode	Periode 5
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M.C.A. Klein
Examinator	dr. M.C.A. Klein
Docent(en)	dr. M.C.A. Klein
Lesmethode(n)	Hoorcollege
Niveau	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

Neural Models of Cognitive Processes

Vakcode	P_MNEUMOD (815051)
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Gedrags- en Bewegingswetensch.
Coördinator	dr. W. Kruijne
Examinator	dr. W. Kruijne
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak
Computational modeling is an important tool for cognitive neuroscience, but the majority of modeling work requires quite some background knowledge on the core principles being applied.
The course is intended to offer insight(s) into what different types of models exist in in cognitive neuroscience, how they can be (and are) used to enrich the field, and it explores what questions arise when evaluating modeling work in this field.

Of note, even though the course offers practical sessions where you work with some models implemented with Python code, this course is explicitly _not_ intended as a programming class intended to test your programming skills.

Inhoud vak
Computational models are an important tool in cognitive neuroscience. A large branch of research focuses on an experimental approach, testing predictions by means of carefully designed experiments. Models, on the other hand, can integrate experimental results into complete and detailed theories that produce testable predictions. As such, they form a critical step in the empirical cycle by generating predictions for future experiments.
When used appropriately, a model allows for the integration of findings from a wide range of experiments. Rather than merely verbal theories, computational models are rich in detail and allow for a mechanistic view on how the brain produces its behavior.

An old adage from statistics is that ``all models are wrong, but some models are useful''. They are wrong because a model by definition is a simplification of reality, but they are useful when they generate testable predictions. However, it can be difficult to assess whether a model is too much of a simplification, and whether its predictions actually are useful. What makes a model good or bad? To what extent do models need to fit the data? And if multiple models fit the data, how do we choose which is the `better one'?
In addition, modeling papers can at times seem rather enigmatic, and for the untrained reader it is all too easy to get lost in the mathematical equations that make up computational models.

This course takes a learn-by-example approach to give an overview of different modeling approaches that are common in neuroscience. We will start at a high level of abstraction, with models that are used to mathematically describe experimental data, with relatively little regard for their implementation in the brain. throughout the course, will work our way `down' towards models of individual spiking neurons. By means of practical sessions, you will get hands-on experience with some of these models and see how they are implemented. By means of `debates', you will learn how to assess different models in terms of their strengths and weaknesses.

Onderwijsvorm
Lectures and discussion, computer tutorial and practicals.

Toetsvorm
Grades are based on a weighted average of performance on a final exam (65%), the practical sessions (25%), and class participation in the debate sessions (10%)

Literatuur
A large part of the courses uses chapters from the book Fundamentals of Computational Neuroscience, Thomas P. Trappenberg (2002).

Additional literature (articles, tutorials) will be provided through Canvas.

Vereiste voorkennis
There is no explicit required knowledge. However, as the practicals have you work with Python code, it might be useful to familiarize oneself with the language. The 'programming for psychologists' course should suffice, and https://www.codecademy.com/learn/python offers a wonderful free online tutorial

Overige informatie
This course is taught every two years. It is taught in 2017-18, not in 2018-19.

Perception for Action

Vakcode	B_PERCACTION (900810)
Periode	Periode 4
Credits	3.0
Voertaal	Engels
Faculteit	Fac. der Gedrags- en Bewegingswetensch.
Coördinator	prof. dr. J.B.J. Smeets
Examinator	prof. dr. J.B.J. Smeets
Docent(en)	prof. dr. J.B.J. Smeets
Lesmethode(n)	Hoorcollege, Computerpracticum
Niveau	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 (including psychophysics) 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 one's 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. The focus will be on the quantitative analysis of perception, using the psychophysical method. Each topic (e.g. proprioception, motion perception) is introduced by a lecture discussing some phenomenology and the underlying mechanisms. Subsequently, the students read several (mostly relatively recent) papers on that topic and answer the questions of an assignment. These papers and questions are discussed in the next lecture.

Onderwijsvorm
Amount of contact hours:
Lectures/tutorial 14
Practical 2
Assignments & self-study 68

Each meeting will be a combination of tutorial consisting of a discussion of the previous assignment (1 hour), and a lecture introducing 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 announced during the course.

Vereiste voorkennis
No entry requirements.

Aanbevolen voorkennis
Basic knowledge of the nervous system is expected (e. g. function of various brain areas).

Prevention of Mental Health Problems

Vakcode	AM_470840 ()
Periode	Periode 3
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	dr. E.M. Sijbrandij

Examinator	dr. E.M. Sijbrandij
Docent(en)	dr. E.M. Sijbrandij
Lesmethode(n)	Hoorcollege, Werkgroep, Computerpracticum
Niveau	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 in January 2017.

Prevention of Mental Health Problems 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, work group meetings, consultation hours, feedback on assignments, answers to questions via the Discussion forum on BB.

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

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

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

To pass this course you have to have at least a 5.5 for 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., & Deeprose, 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, 1669-1678. doi:10.1111/j.1360-0443.2009.02677.x

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

Vakcode	XMU_418145 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	O.W. Schrofer
Examinator	O.W. Schrofer

Inhoud vak
http://studiegids.uva.nl/xmlpages/page/2017-2018/zoek-vak/vak/29519

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

Review Paper

Vakcode	P_MREVPAP ()
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Gedrags- en Bewegingswetensch.
Coördinator	dr. W. Donk
Examinator	dr. W. Donk
Niveau	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 will be given on Canvas.

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

Literatuur
The literature depends on the specific topic chosen.

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 in PSR.

Seminar Attention

Vakcode	P_MSEMATT (815100)
Periode	Periode 5
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Gedrags- en Bewegingswetensch.
Coördinator	prof. dr. J.L. Theeuwes
Examinator	prof. dr. J.L. Theeuwes
Docent(en)	prof. dr. J.L. Theeuwes
Lesmethode(n)	Hoorcollege
Niveau	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. Students have to prepare a 15 minute oral presentation in Microsoft Powerpoint. The rest of the class will be spent discussing the target articles. The presentation will determine 30% of the course grade for each student. The target papers will be available via Canvas. Each student will also submit a review paper on one of the topics covered in class. The paper will be worth 50%. At the start of each class there will be a short quiz on the papers that will be discussed during class (20 % of the grade).

Onderwijsvorm
Lectures, discussions and presentations

Toetsvorm
Student presentation (30%), paper (50%) and quizzes (20%).
Students are allowed to miss only one class.

Literatuur
Articles (Canvas)

Seminar Cognitive Neuroscience

Vakcode	P_MSEMCNS (815098)
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Gedrags- en Bewegingswetensch.
Coördinator	dr. A.V. Belopolskiy
Examinator	dr. A.V. Belopolskiy
Docent(en)	dr. A.V. Belopolskiy
Lesmethode(n)	Hoorcollege

Niveau	500

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

Inhoud vak
This is an advanced course on the current topics in cognitive neuroscience. After this course the students will have a firm understanding of the current state of affairs in the area of Cognitive Neuroscience, the current directions of the field and the contemporary methods that are used. Students will be able to present a summarized research article, critically evaluate it and discuss it with peers. Students will be prepared for choosing a topic for the future research project , internship or a thesis. 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 consciousness, default network, 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 open-end exam

Literatuur
The list of research papers will be announced

Vereiste voorkennis
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.

Spatial Criminology

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

Doel vak
(1) Students acquire knowledge of the latest theories and studies on the spatial distribution of crime;
(2) Student are able to create (crime) maps using freeware GIS software like QGIS as well as perform basic spatial criminological analyses with 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 analyses 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 the level of social cohesion in a neighborhood.
How such a relationship can be studied from a environmental criminological perspective and with what
spatial analysis methods is discussed in the course.
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.

Onderwijsvorm
As this course is mostly practice based (i.e. a lab course), attendance is of importance.

Toetsvorm
To be announced

Literatuur
Literature is made available via Canvas.

Aanbevolen voorkennis
Students should have basic knowledge of research methods and quantitative statistical analyses.

Intekenprocedure
For this course a maximum of 30 student may be registered. If the course is full no more places will be made available.

Overige informatie
This course requires you to bring your own laptop.
Windows laptops are preferred due to the software.

Technology for Games

Vakcode	XMU_418146 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen

Inhoud vak

http://studiegids.uva.nl/xmlpages/page/2017-2018/zoek-vak/vak/39070

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

The Social Web

Vakcode	X_405086 ()
Periode	Periode 4
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. D. Ceolin MSc
Examinator	dr. D. Ceolin MSc
Lesmethode(n)	Hoorcollege, Computerpracticum
Niveau	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 group assignments and final individual paper

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

Aanbevolen voorkennis
Basic programming skills

Doelgroep
VU: mIS
UvA: master Information Studies - Human-Centered Multimedia
mCS

mAI

Watson Innovation

Vakcode	X_405129 ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. L.M. Aroyo
Examinator	dr. L.M. Aroyo
Docent(en)	dr. L.M. Aroyo, A. Dumitrache MSc
Lesmethode(n)	Hoorcollege, Computerpracticum
Niveau	400

Doel vak
The Watson Innovation course is a collaboration between the Vrije Universiteit, University of Amsterdam and IBM Netherlands. It offers a unique opportunity to learn about IBM Watson, cognitive computing and the meaning of such artificial intelligence systems in a real world and big data context. Students from Computer Science and Economics faculties will join their complementary efforts and creativity in cross-disciplinary teams to explore the business and innovation potential of these technologies.

Inhoud vak
- Basics of Cognitive Computing and IBM Watson
- Understanding the original IBM Watson
- Develop ideas for Cognitive Computing apps
- Build real prototypes using IBM Watson technologies
- Showcase your ideas to real clients.

Onderwijsvorm
Lectures & practical sessions at locations of the VU Amsterdam and IBM Netherlands.

Toetsvorm
Evaluation of group projects and individual peer-reviews

Literatuur
Course lecture slides and related articles:
- What is IBM Watson? (http://www.ibm.com/smarterplanet/us/en/ibmwatson/what-is-watson.html)
- Building Watson: An overview of the DeepQA project (http://www.aaai.org/ojs/index.php/aimagazine/article/download/2303/2165
- CrowdTruth papers (http://crowdtruth.org/papers/)

Aanbevolen voorkennis
knowledge in machine learning is recommended

Doelgroep
A balanced mix of Computer Science, AI, Information Science, Business Analytics and Business & Economics students (from VU as well as UvA) in their 3rd year of bachelor or master level.

Intekenprocedure
Places are limited, so sign up as soon as possible. For questions, please contact b.timmermans@vu.nl or oana.inel@vu.nl

Overige informatie
Lecturer(s)
dr. L.M. Aroyo, B. Timmermans, O.Inel, A. Dumitrache