



Artificial Intelligence MSc

Vrije Universiteit Amsterdam - Faculteit der Exacte Wetenschappen - M Artificial Intelligence - 2013-2014

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

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

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

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

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

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

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Research Variant Cognitive Science

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

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

The programme consists of 120 credits

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

Opleidingsdelen:

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

Recommended Optional Courses

Vakken:

Naam	Periode	Credits	Code
Advanced Data Analysis	Periode 4	6.0	P_MADV DAT
Behaviour Dynamics	Periode 2	6.0	X_400113
Comparative Modeling	Periode 6	6.0	X_405091
Experimental Design and Data Analysis	Periode 5	6.0	X_405078
Human Ambience Innovation	Periode 1	6.0	X_405053
ICT4D: Information and communication technology for Development	Periode 5	6.0	X_405101
Internet programming	Periode 1	6.0	X_405082

Mini-Master Project AI	Ac. Jaar (september)	6.0	X_400428
Perception	Periode 5	6.0	P_MPERCEP
Review Paper	Ac. Jaar (september)	6.0	P_MREVPAP
Science and Society in a Hist. Persp.	Periode 5	6.0	X_400424
Seminar Attention	Periode 3	6.0	P_MSEMATT

Compulsory Courses

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

Vakken:

Naam	Periode	Credits	Code
Brain Imaging	Periode 1	6.0	P_MBRIMAG
Evolutionary Computing	Periode 1	6.0	X_400111
Human Information Processing	Periode 5	6.0	P_MHINFOP
Knowledge Engineering	Periode 2+3	6.0	X_405099
Model-based Intelligent Environments	Periode 1	6.0	X_405056
Neural Models of Cognitive Processes	Periode 2	6.0	P_MNEUMOD
Research Methods	Periode 2	6.0	X_405085
Seminar Cognitive Neuroscience	Periode 2	6.0	P_MSEMCNS
Thinking and Deciding	Periode 2	6.0	P_MTHIDEC

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

Research Variant Human Ambience

In the Master variant Human Ambience you learn on a detailed level how to model both mental and physiological processes of human functioning. For instance, you can learn how to model the mental and physical states associated with depression. Such models are then used in applications that support humans in their daily lives in a dedicated manner, also to enable the developed support systems to understand humans better. In the specialization phase of the master you can study

relevant courses with respect to an application area (e.g. support of people during exercising, or elderly care) or a relevant scientific discipline (e.g. psychology, sociology, movement sciences, biomedical sciences, criminology, etc.). During your final Master project you will then combine your domain knowledge with the knowledge of modeling such human processes.

The programme consists of 120 credits

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

Opleidingsdelen:

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

Optional courses

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

Opleidingsdelen:

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

Vakken:

Naam	Periode	Credits	Code
Advanced Information Retrieval	Ac. Jaar (september)	6.0	X_418043
Advanced Logic	Periode 4	6.0	X_405048
Data Mining Techniques	Periode 5	6.0	X_400108
ICT4D: Information and communication technology for Development	Periode 5	6.0	X_405101
Intelligent Web Applications	Periode 4	6.0	X_405055
Knowledge and Media	Periode 1	6.0	X_405065
Mini-Master Project AI	Ac. Jaar (september)	6.0	X_400428
Science and Society in a Hist. Persp.	Periode 5	6.0	X_400424

Optional courses Health

Vakken:

Naam	Periode	Credits	Code
Health Promotion and Disease Prevention	Periode 1	6.0	AM_470811
Health Psychology	Periode 2	6.0	AM_470730
Prevention of Mental Health Problems	Periode 3	6.0	AM_470840

Optional courses Mental Functioning/Health

Vakken:

Naam	Periode	Credits	Code
Advanced Data Analysis	Periode 4	6.0	P_MADV DAT
Aging and Dementia	Periode 1+2, Periode 3+4	6.0	P_MAGINGD
Brain Imaging	Periode 1	6.0	P_MBRIMAG
Human Information Processing	Periode 5	6.0	P_MHINFOP
Neural Models of Cognitive Processes	Periode 2	6.0	P_MNEUMOD
Perception	Periode 5	6.0	P_MPERCEP
Seminar Attention	Periode 3	6.0	P_MSEMATT
Seminar Cognitive Neuroscience	Periode 2	6.0	P_MSEMCNS
Thinking and Deciding	Periode 2	6.0	P_MTHIDEC

Optional courses Movement

Vakken:

Naam	Periode	Credits	Code
Coordination Dynamics: Prin. Clin. Appl.	Periode 2	3.0	B_CLINCORDYN
Dynamica van Lineaire Systemen	Periode 1	3.0	B_DYNAMICA
Energy Flow Models	Periode 2	3.0	B_ENERFLOW
Perception for Action	Periode 4	3.0	B_PERCACTION

Optional courses Criminology

Vakken:

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

Optional courses Safety/Networks/Policy

Vakken:

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

Compulsory Courses

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

Vakken:

Naam	Periode	Credits	Code
Behaviour Dynamics	Periode 2	6.0	X_400113
Comparative Modeling	Periode 6	6.0	X_405091
Evolutionary Computing	Periode 1	6.0	X_400111
Experimental Design and Data Analysis	Periode 5	6.0	X_405078
Human Ambience Innovation	Periode 1	6.0	X_405053
Knowledge Engineering	Periode 2+3	6.0	X_405099
Master Project	Ac. Jaar (september)	30.0	X_400285
Model-based Intelligent Environments	Periode 1	6.0	X_405056
Research Methods	Periode 2	6.0	X_405085

Research Variant Web Science

This specialisation focuses on the study of the Web as an artefact from both the technical and social perspectives. Students study computational techniques to analyse web content including network analysis, access to web information, reasoning over reached web data, data mining and information retrieval techniques. You will also learn skills for intervention on the Web including fundamental internet protocols and the

strategies and techniques for developing web applications. There is a strong emphasis on applying these techniques in practice.

From a social perspective, students study the social aspects of the web including social network theory, how the law plays out in e-commerce, how innovative business can be understood in a web-style networked environment, and how knowledge and know-how are represented, acquired and spread in open systems such as the Web.

The programme consists of 120 credits

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

Opleidingsdelen:

- [Compulsory Optional Courses Technical Web](#)
- [Compulsory Optional Courses Application Related](#)
- [Optional Courses](#)
- [Compulsory Courses](#)

Compulsory Optional Courses Technical Web

Vakken:

Naam	Periode	Credits	Code
Advanced Information Retrieval	Ac. Jaar (september)	6.0	X_418043
Automated Reasoning in AI	Periode 5	6.0	X_400389
Data Mining Techniques	Periode 5	6.0	X_400108
Intelligent Web Applications	Periode 4	6.0	X_405055
The Social Web	Periode 4	6.0	X_405086

Compulsory Optional Courses Application Related

Compulsory 12 ec

Vakken:

Naam	Periode	Credits	Code
E-Commerce Law	Periode 5	6.0	R_E.commerc
Knowledge and Media	Periode 1	6.0	X_405065

Optional Courses

Vakken:

Naam	Periode	Credits	Code
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Advanced Logic	Periode 4	6.0	X_405048
Advanced Selforganisation	Periode 2	6.0	X_400434
Behaviour Dynamics	Periode 2	6.0	X_400113
Coding and Cryptography	Periode 1	6.0	X_405041
Comparative Modeling	Periode 6	6.0	X_405091
Concurrency and Multithreading	Periode 1	6.0	X_405064
Distributed Algorithms	Periode 2	6.0	X_400211
Distributed Systems	Periode 2	6.0	X_400130
Human Ambience Innovation	Periode 1	6.0	X_405053
ICT4D: Information and communication technology for Development	Periode 5	6.0	X_405101
Internet programming	Periode 1	6.0	X_405082
Logical Verification	Periode 5	6.0	X_400115
Mini-Master Project AI	Ac. Jaar (september)	6.0	X_400428
Mobile Systems	Periode 4	6.0	X_418068
Multimedia Authoring	Periode 1	6.0	X_405098
Neurale Netwerken	Periode 1	6.0	X_400132
Operating Systems	Periode 5	6.0	X_405067
Parallel Programming for High-performance Applications	Periode 1	6.0	X_400161
Science and Society in a Hist. Persp.	Periode 5	6.0	X_400424
Service Oriented Design	Periode 1	6.0	X_405061
Software Architectuur	Periode 2	6.0	X_400170
Software Testing	Periode 4	6.0	X_400439

Compulsory Courses

Vakken:

Naam	Periode	Credits	Code
Evolutionary Computing	Periode 1	6.0	X_400111
Experimental Design and Data Analysis	Periode 5	6.0	X_405078
Information Visualization	Ac. Jaar (september)	6.0	X_418143
Knowledge Engineering	Periode 2+3	6.0	X_405099
Master Project	Ac. Jaar (september)	30.0	X_400285
Model-based Intelligent Environments	Periode 1	6.0	X_405056
Research Methods	Periode 2	6.0	X_405085

Research variant Intelligent Systems

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

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

The programme consists of 120 credits

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

Opleidingsdelen:

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

Constrained choice (12 EC)

Vakken:

Naam	Periode	Credits	Code
Advanced Information Retrieval	Ac. Jaar (september)	6.0	X_418043
Automated Reasoning in AI	Periode 5	6.0	X_400389
Experimental Design and Data Analysis	Periode 5	6.0	X_405078
Neurale Netwerken	Periode 1	6.0	X_400132
The Social Web	Periode 4	6.0	X_405086

Optional Courses

Vakken:

Naam	Periode	Credits	Code
Advanced Logic	Periode 4	6.0	X_405048
Behaviour Dynamics	Periode 2	6.0	X_400113
Comparative Modeling	Periode 6	6.0	X_405091
Distributed Algorithms	Periode 2	6.0	X_400211

Distributed Systems	Periode 2	6.0	X_400130
Human Ambience Innovation	Periode 1	6.0	X_405053
ICT4D: Information and communication technology for Development	Periode 5	6.0	X_405101
Knowledge and Media	Periode 1	6.0	X_405065
Mini-Master Project AI	Ac. Jaar (september)	6.0	X_400428
Operating Systems	Periode 5	6.0	X_405067
Science and Society in a Hist. Persp.	Periode 5	6.0	X_400424

Compulsory Courses

Vakken:

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

Advanced Data Analysis

Vakcode	P_MADV DAT (815033)
Periode	Periode 4
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Psychologie en Pedagogiek
Coördinator	dr. M. Gallucci
Docent(en)	dr. M. Gallucci
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak

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

Inhoud vak

After an introduction of the general linear model, with emphasis on estimation of effect sizes and hypothesis testing, the course concentrates on applications of the model, such as analysis of variance,

regression analysis, path analysis, and logistic regression. Along with these techniques, issues such as mediation, moderation, and hypothesis testing are considered. The aim of the course is to enable students to plan, execute, and interpret appropriate statistical analyses for applied and experimental research data. Because the application of advanced statistical techniques is central to the course, students will have several assignments to analyze existing data sets, and interpret the results.

Onderwijsvorm

Lectures and tutorials.

Toetsvorm

Exams and assignments.

Literatuur

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

Advanced Information Retrieval

Vakcode	X_418043 (418043)
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Niveau	500

Inhoud vak

The course description is available on:

<http://studiegids.uva.nl/web/uva/sgs/en/c/10048.html>

Overige informatie

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

Advanced Logic

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

Doel vak

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

Inhoud vak

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

Onderwijsvorm

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

Toetsvorm

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

Literatuur

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

Aanbevolen voorkennis

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

Doelgroep

mAI, mCS, mPDCS

Advanced Selforganisation

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

Doel vak

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

Inhoud vak

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

firefly flashing, evolution by natural selection, game theory and the evolution of cooperation. The course includes a practical part in which students implement a simulation of a self-organizing complex system and conduct structured experimental analysis with this simulation.

Onderwijsvorm

Theory in lectures and practice in labs.

Toetsvorm

Report including description of simulation and experimental analysis.

Literatuur

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

Doelgroep

mAI, mBA, mCS, mPDCS

Overige informatie

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

Aging and Dementia

Vakcode	P_MAGINGD (815181)
Periode	Periode 1+2, Periode 3+4
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Psychologie en Pedagogiek
Coördinator	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.

Literatuur

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

Overige informatie

This course will be lectured twice:

- In periode 1+2 the course is scheduled for the Research master Cognitive neuropsychology.
- In period 3+4 the course is scheduled for the Master psychology, trace Clinical neuropsychology.

Students who have followed the course "Neuropsychological Disorders: Development and Course II" (course code 813088) during their Bachelor Psychology at VU University are refused the exam of "Aging and Dementia". Instead, these students are allowed to follow one of the two courses of the Research master Cognitive Neuropsychology, "Neuropsychological Dysfunctioning in Psychiatric disorders" or "Perception".

Automated Reasoning in AI

Vakcode	X_400389 (400389)
Periode	Periode 5
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. F.A.H. van Harmelen
Docent(en)	prof. dr. F.A.H. van Harmelen
Lesmethode(n)	Hoorcollege
Niveau	500

Doel vak

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

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

Inhoud vak

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

In a nutshell, we plan to cover:

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

Onderwijsvorm

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

Toetsvorm

3 practical assignments

Literatuur

Selected scientific papers.

Vereiste voorkennis

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

Doelgroep

mAI

Overige informatie

For further information see the AR in AI blackboard site.

Behaviour Dynamics

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

Doel vak

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

Inhoud vak

Behavioural dynamics in social networks occurs in different forms, contexts and complexity.

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

Onderwijsvorm

Combinations of lectures and practical assignments.

Toetsvorm

Practical assignments.

Literatuur

Online reader.

Vereiste voorkennis

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

Aanbevolen voorkennis

Somer background in modelling and logical formalisms.

Doelgroep

mAI

Beleid en management

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

Doel vak

- Het beschikken over kennis van recente benaderingen, inzichten en theorieën over de ontwikkeling, het management en de implementatie van publiek beleid, mede gelet op de toenemende complexiteit van a) moderne samenlevingsvraagstukken en b) de institutionele vormgeving van het bestuur, waaronder begrepen de verdeling van taken en verantwoordelijkheden tussen publieke, semi-publieke en private actoren.
- Het beschikken over een onafhankelijke opstelling en een vermogen tot kritische reflectie ten opzichte van deze benaderingen, inzichten en theorieën.
- Het kunnen toepassen van deze benaderingen, inzichten en theorieën op concrete vraagstukken van beleid en management in de publieke sector, dit met het oog op zowel de analyse als de vormgeving van beleid.

Inhoud vak

Beleid maken, het is gemakkelijk gezegd, maar in onze complexe samenleving bepaald geen sinecure. De maatschappelijke vraagstukken zijn verre van inzichtelijk, en gewoonlijk zijn bij het beleidsprobleem ook nog eens veel verschillende stakeholders betrokken, ieder met hun eigen waarden, belangen en gezichtspunten. Ondertussen vragen veeleisende burgers wel om tastbare beleidsprestaties. Daarnaast is het steeds meer de vraag of beleidsinterventies nog wel kans van slagen hebben in een wereld die minder 'maakbaar' lijkt geworden: wat mogen we tegenwoordig eigenlijk nog verwachten van het overheidsbeleid? Mede met het oog op die vraag, zijn het management en de uitvoering van beleid steeds meer een puzzel geworden: om tot succes te komen, worden steeds meer partijen in de beleidsketen betrokken, waaronder ook private ondernemingen en maatschappelijke organisaties. Dit kan nuttig zijn, maar het compliceert het management en de beleidsuitvoering ook. Tegen deze achtergrond draait het in dit masterseminar om de volgende vragen: wat leren moderne

wetenschappelijke inzichten ons a) over de maakbaarheid van beleid, (oorzaken van beleidsstagnatie; mogelijkheden van beleidsvernieuwing) en b) over de mogelijkheden om beleid uit te voeren in complexe en hybride' institutionele structuren (beleidsnetwerken, marktwerking, en dergelijke). Gedurende het seminar zal de aandacht worden gericht op specifieke beleidssectoren.

Toetsvorm

Schriftelijke opdracht

Literatuur

- Arentsen, M., W.Trommel, Moderniteit en Overheidsbeleid, Bussum, Coutinho 2005.
- Trommel, W., Gulzig bestuur, Den Haag, Lemma 2009.
- Nader op te geven cq te verstrekken literatuur en beleidsdocumenten.

Doelgroep

Masterstudenten Bestuurskunde

Brain Imaging

Vakcode	P_MBRIMAG (815103)
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Psychologie en Pedagogiek
Coördinator	dr. D.J. Heslenfeld
Examinator	dr. D.J. Heslenfeld
Docent(en)	dr. D.J. Heslenfeld
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak

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

Inhoud vak

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

Onderwijsvorm

Lectures and obligatory practicals.

Toetsvorm

Written examination

Literatuur

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

Coding and Cryptography

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

Doel vak

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

Inhoud vak

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

Onderwijsvorm

Lectures and exercise classes

Toetsvorm

Written exam and homework

Literatuur

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

Aanbevolen voorkennis

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

Doelgroep

mAI, mCS, mMath, mPDCS

Comparative Modeling

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

Doel vak

At the end of the course, you will:

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

Inhoud vak

This course provides an overview of different types of computational models of human processes, and shows how they can be related to each other. In particular, the course shows how such models can be classified according to three dimensions: the process abstraction dimension, the temporal dimension, and the clustering dimension. In addition, interlevel relations between different models in the classification scheme are addressed. These topics are illustrated by means of examples from biomedical, psychological, and social disciplines, and are applied in assignments where models are developed for relevant applications within Ambient Intelligence.

Onderwijsvorm

Lectures, seminars, and lab sessions.

Toetsvorm

Lab assignments and exam

Literatuur

Online syllabus

Doelgroep

mAI

Overige informatie

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

Concurrency and Multithreading

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

Doel vak

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

Inhoud vak

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

Onderwijsvorm

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

Toetsvorm

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

Literatuur

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

Doelgroep

mAI-CIS, mAI-KTIIA, mAI-TAI, mCS-FMSV, mCS-HPDC, mCS-IWT, mCS-MM, mCS-SE, mCS-TAI, mPDCS

Overige informatie

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

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

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

Coordination Dynamics: Prin. Clin. Appl.

Vakcode	B_CLINCORDYN (900666)
Periode	Periode 2
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Bewegingswetenschappen
Coördinator	dr. M. Roerdink

Docent(en)	dr. M. Roerdink
Lesmethode(n)	Hoorcollege, Computerpracticum, Practicum
Niveau	400

Doel vak

The student is acquainted with the principles, concepts and methods of coordination dynamics, as used in the study of basic and pathological movements. The student can explain these aspects of coordination dynamics in a qualitative manner and is able to indicate how they may contribute to clinical diagnosis and intervention.

Inhoud vak

The coordination dynamics approach is pursued to study how patterns of coordinated movement come about, persist and change as a function task constraints, learning, expertise and pathology. 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.

The first part of the course provides an overview of the principles, concepts and methods of coordination dynamics.

The second part of the course focuses on the application of coordination dynamics in a clinical (rehabilitation) setting, with specific emphasis on pathological gait and interventions based on environmental coupling. Specifically, coordination dynamics provides a framework to study the nature of healthy and pathological movements by assessing stability and loss of stability of coordination patterns, thereby assisting the diagnosis and evaluation of rehabilitation-induced changes in coordination. Furthermore, coordination dynamics may promote therapeutic interventions based on environmental coupling, aimed at facilitating desired coordination patterns and/or stabilizing existing unstable coordination patterns.

Onderwijsvorm

Amount of contact hours, divided in:

Lectures: 8 * 1.75 hrs

Laboratories: 2 * 2.00 hrs

Computer Practicals: 5 * 2.00 hrs

Exam: 2.75 hrs

Part 1: Principles of coordination dynamics

- Lecture 1: How nature handles complexity: self-organization of behavior
- Lecture 2: Coordination dynamics at multiple levels
- Lecture 3: Tools and methods of coordination dynamics
- Laboratory 1: Relative phase and phase transitions in action
- Practical 1: Analyses of rhythmic interlimb coordination
- Practical 2: Analyses of rhythmic sensorimotor coordination

Part 2: Clinical applications of coordination dynamics

- Lecture 4: Introduction to clinical coordination dynamics
- Lecture 5: Interventions based on environmental coupling
- Laboratory 2: Clinical coordination dynamics in action

- Practical 3: Functional changes in interlimb interactions following stroke
- Practical 4: Pathological gait modulation with visual and acoustic cues
- Lecture 6: Coordination dynamics and pathological gait
- Lecture 7: Coordination dynamics in the future
- Practical 5: Optional class for questions and feedback
- Lecture 8: Feedback on Laboratories and Practical plus discussion on example exam questions

The practical exercises aim to apply the principles of coordination dynamics to concrete experimental and clinical settings. The Laboratories entail hands-on experience with examining rhythmic interlimb and sensorimotor coordination as well as assessments and interventions involving environmental couplings in rehabilitation practice. The computer practicals are included to become acquainted with the handling and interpretation of the gathered data using methods of coordination dynamics (Matlab scripts and functions are provided; no programming skills required). Note that Laboratory 2 will be held at the Duyvensz-Nagel Research Laboratory of Reade Center for Rehabilitation and Rheumatology (DNO, Reade, Overtoom 283).

Toetsvorm

Interim (20%) and final (80%) written exam, consisting of a combination of open questions and true/false statements

Literatuur

A selection of relevant book chapters and articles.

Data Mining Techniques

Vakcode	X_400108 (400108)
Periode	Periode 5
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	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 and compulsory practical work. Lectures are planned to be interactive: there will be small questions, one-minute discussions, etc.

Toetsvorm

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

Literatuur

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

Aanbevolen voorkennis

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

Doelgroep

mBA, mCS, mAI, mBio

Distributed Algorithms

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

Doel vak

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

Inhoud vak

Snapshots, graph traversal, termination detection, garbage collection, deadlock detection, routing, election, minimal spanning trees, anonymous networks, fault tolerance, failure detection,

synchronization, consensus, mutual exclusion, self-stabilization, on-line scheduling.

Onderwijsvorm

4 hours per week HC
4 hours per week WC

Toetsvorm

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

Literatuur

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

Doelgroep

mAI, mCS, mPDCS

Overige informatie

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

Distributed Systems

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

Doel vak

After taking this course, you will be able to:

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

Inhoud vak

It is difficult to imagine a standalone modern computer system: every such system is one way or the other connected through a communication network with other computer systems. A collection of networked computer systems is generally referred to as a distributed (computer) system. As with any computer system, we expect a distributed system to simply work, and often even behave as if it were a single computer system. In other words, we would generally like to see all the issues related to the fact that data, processes, and control are actually distributed across a network hidden behind well-defined and properly

implemented interfaces. Unfortunately, life is not that easy.

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

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

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

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

Onderwijsvorm

The course is taught as a series of lectures.

Toetsvorm

There is a written exam.

Literatuur

Andrew S. Tanenbaum, Maarten van Steen, "Distributed Systems, Principles and Paradigms", 2nd edition, Prentice-Hall (2007).

Vereiste voorkennis

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

Doelgroep

mCS, mPDCS, mAI, mIS

Dynamica van Lineaire Systemen

Vakcode	B_DYNAMICA (900314)
Periode	Periode 1
Credits	3.0
Voertaal	Nederlands
Faculteit	Faculteit der Bewegingswetenschappen
Coördinator	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 dynamische systemen te beschrijven. Er worden methoden gepresenteerd om toestandsmodellen op te stellen, uit een differentiaalvergelijking dan wel door koppeling van deelsystemen, en deze te analyseren. In werkelijkheid zijn vrijwel alle dynamische systemen in meerdere of mindere mate niet- lineair toch is het vaak zinvol om ze lokaal bij benadering als lineair te beschouwen. In de cursus leer je hoe je systemen kunt lineariseren, en daarmee relevante informatie over het niet- lineaire systeem verkrijgt. Diverse voorbeelden uit de bewegingswetenschappen illustreren de stof.

Onderwijsvorm

Hoorcolleges in combinatie met computerpractica en inleveropdrachten.

Urenverdeling:

16 uur hoor/responsiecollege;

24 uur voorbereiding colleges/practica;

21 uur computerpractica;

17 uur tentamenvoorbereiding;

2 uur tentamen.

Toetsvorm

schriftelijk tentamen

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

Literatuur

Syllabus (interne publicatie).

Overige informatie

Het wordt aanbevolen om dit vak te volgen in combinatie met het vak: Simulatiemodellen van skeletsystemen, code 900319

E-Commerce Law

Vakcode	R_E.commerc (200942)
Periode	Periode 5

Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Rechtsgeleerdheid
Coördinator	prof. mr. A.R. Lodder
Examinator	prof. mr. A.R. Lodder
Docent(en)	prof. mr. A.R. Lodder
Lesmethode(n)	Lezing, Werkgroep
Niveau	500

Doel vak

The prime goal of the course is to obtain a general understanding of legal issues that occur when doing business online. The European Union directives related to electronic commerce are taken as a starting point in this course.

Inhoud vak

E-commerce conducted between businesses is already quite successful, and so is consumer e-commerce. Current legislation has been drafted for a paper-based society. For the information society services adaptations to existing legislation or drafting of new legislation is necessary. For that purpose the European Commission has enacted several directives over the years. The course gives insight into the main issues on e-commerce such as liability of service providers, electronic contracting, identity theft and online dispute resolution.

Onderwijsvorm

Layered knowledge transfer model:

1. Reading Materials;
2. Lecture;
3. Three questions, with changing groups of three;
4. Interactive tutorial.

Guarantees pleasant course, and obtaining good knowledge.

Toetsvorm

The course will be assessed by the following components:

- Paper(s).
- Presentation(s).
- Assignment(s).

Literatuur

Via Blackboard, inter alia Lodder & Kaspersen (eds.) Edirectives.

Overige informatie

In the course 2012/13 we experimented with 2 minute videos to be recorded by students on selected topics.

Energy Flow Models

Vakcode	B_ENERFLOW (900675)
Periode	Periode 2
Credits	3.0

Voertaal	Engels
Faculteit	Faculteit der Bewegingswetenschappen
Coördinator	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;
34 hours (28 practical, 6 lecture).

Toetsvorm

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

Literatuur

A selection of articles and practical guide on Blackboard.

Vereiste voorkennis

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

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

Evolutionary Computing

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

Doel vak

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

Inhoud vak

The course is treating various algorithms based on the Darwinian evolution theory. Driven by natural selection (survival of the fittest), an evolution process is being emulated and solutions for a given problem are being "bred". During this course all "dialects" within evolutionary computing are treated (genetic algorithms, evolutiestrategieën, evolutionary programming, genetic programming, and classifier systems). Applications in optimisation, constraint handling and machine learning are discussed. Specific subjects handled include: various genetic structures (representations), selection techniques, sexual and asexual genetic operators, (self-)adaptivity. If time permits, subjects in Artificial Life and Evolutionary Robotics will be handled. Hands-on-experience is gained by a compulsory programming assignment.

Onderwijsvorm

Oral lectures and compulsory programming assignment.

Toetsvorm

Written exam and programming assignment (weighted average).

Literatuur

Eiben, A.E., Smith, J.E., Introduction to Evolutionary Computing. Springer, 2003 ISBN 3-540-40184-9.
Slides available from <http://www.cs.vu.nl/~gusz/ecbook/ecbook.html> .

Doelgroep

mBA, mAI, mCS, mPDCS

Experimental Design and Data Analysis

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

Doel vak

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

- design experiments and analyse the results according to the design
- analyse data using the common anova designs

- analyse data using linear regression or a generalized linear regression model
- perform basic nonparametric tests
- perform bootstrap and permutation tests

Inhoud vak

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

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

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

Onderwijsvorm

Lectures, computer class, discussion of the computer assignments.

Toetsvorm

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

Literatuur

literature (course reading)

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

For background reading one may look at:

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

Aanbevolen voorkennis

introductory statistics. e.g. Empirical Methods

Doelgroep

mAI, mCS

Overige informatie

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

Fysieke veiligheid en crisisbeheersing

Vakcode	S_FVC ()
Periode	Periode 4

Credits	6.0
Voertaal	Nederlands
Faculteit	Faculteit der Sociale Wetenschappen
Coördinator	dr. F.P. Wagenaar
Docent(en)	dr. F.P. Wagenaar, J.J. Wolbers MSc, dr. mr. W.J. Kortleven
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	500

Doel vak

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

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

Inhoud vak

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

Onderwijsvorm

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

Toetsvorm

Er wordt getoetst op basis van een take home tentamen.

Literatuur

Wordt via blackboard bekend gemaakt.

Doelgroep

Masterstudenten Bestuurskunde, variant BvV

Governance of Security and Policing

Vakcode	S_GSP ()
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Sociale Wetenschappen
Lesmethode(n)	Hoorcollege
Niveau	500

Doel vak

This seminar seeks to expand the analytical knowledge of students about the governance of security and policing from an international and a comparative perspective.

Inhoud vak

This seminar provides a general introduction to discussions about the organization and governance of security and policing in the Netherlands and abroad. In particular, the transformation of the state will be analyzed from the perspective of shifts in international governance. We will also pay attention to the effects for governance of the merger between internal and external security. Further issues we will look at are the practices of policing, the domestic and international governance of anti-terrorism and anti-organized crime strategies within the EU, international police cooperation, and good governance criteria like transparency, integrity and accountability.

Onderwijsvorm

Seminar

Toetsvorm

Assessment is based on active participation in the seminar and a written exam.

Literatuur

A. Verhage et al, Policing in Europe, Maklu, 2010, isbn 978-90-466-0333-8.

A selection of other relevant literature will be made available in the course.

Doelgroep

Master students Bestuurskunde, track BvV

Overige informatie

- Students are expected to be familiar with main governance concepts;
- Please bear in mind that this seminar is in English. This means that passive and active command of the English language in reading, writing and speaking is required, particularly in view of the written exam. It is desirable, but not compulsory, to write and submit the exam in the English language.

Health Promotion and Disease Prevention

Vakcode	AM_470811 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Fac. der Aard- en Levenswetenschappen
Coördinator	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 focuses on lifestyle/ health behaviours 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:

- Health promotion & disease prevention; concepts, definitions and history.
- Intervention mapping; designing theory- and evidence-based health promotion programs.
- Health-related quality of life; the role of perceived mental and physical health status.
- Effect and process evaluation; principals, perspectives on process evaluation, and determining the effects of health promotion programs.
- Economic evaluations 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

Lectures, guest speakers, assignment (study protocol) and self study.

Total contact hours of the course by teaching methods:

Lectures: 20 hours

Tutorials: 4 hours

Peer review sessions: 4 hours

Study protocol: 8-12 hours per week

Self study: 8-12 hours per week

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 6.0 or higher.

Literatuur

Students will use a course manual, and additional course materials are provided on Blackboard.

Literature details:

Lecture 2+3 Bartholomew et al., (2011) "overview of intervention mapping". Chapter 1. In: Bartholomew, Parcel, Kok, Gottlieb, Fernandez (eds) Planning health promotion programs: an intervention mapping approach; third edition. Jossey-Bass, San Fransisco, pp 3-49.

Lecture 3 Bartholomew et al., (2011) "Intervention mapping step 3". Chapter 6. In: Bartholomew, Parcel, Kok, Gottlieb, Fernandez (eds) Planning health promotion programs: an intervention mapping approach; third edition. Jossey-Bass, San Fransisco, pp 309-329; 356-35; 370-377.

Lecture 3 Michie S et al. A refined taxonomy of behaviour change techniques to help people change their physical activity and healthy eating behaviours: the CALO-RE taxonomy. Psychol Health. 2011 Nov;26(11):1479-1498

Lecture 4 van 't Riet et al. The importance of habits in eating behaviour. An overview and recommendations for future research.

Appetite. 2011, 57;585-596.

Lecture 4 Swinburn B, et al. Dissecting obesogenic environments: the development and application of a framework for identifying and prioritizing environmental interventions for obesity. *Prev Med.* 1999;29:563-70.

Lecture 4 Karen Glanz et al. (2008). Ecological Models of Health Behavior (Sallis JF, Owen N, and Fisher EB); Chapter 20. In: *Health Behavior and Health Education: Theory, Research, and Practice*, 4th Edition; pp 465-485.

Lecture 5 Hawkins RP et al. Understanding tailoring in communicating about health. *Health Educ Res.* 2008 Jun;23(3):454-466.

Lecture 5 Korp P. Health on the Internet: implications for health promotion. *Health Educ Res.* 2006 Feb;21(1):78-86.

Lecture 5 Kreps GL, Neuhauser L. New directions in eHealth communication: Opportunities and challenges. *Pat Edu and Counsel.* 2010 (78); 329-336.

Lecture 5 Neiger BL et al . Use of social media in health promotion: purposes, key performance indicators, and evaluation metrics. *Health Promot Pract.* 2012 Mar;13(2):159-164.

Lecture 6 Harting J et al. (2008) The community approach to health education. Chapter 8; in het Engels vertaald uit Brug J, van Assema en Lechner L. *Gezondheidsvoorlichting en gedragsverandering: een planmatige aanpak.*

Lecture 7 Peter M Fayers & David Machin , "Introduction" (2007), *Quality of Life: the assessment, analysis, and interpretation of patient-reported outcomes / edited by Peter M Fayers & David Machin*, 2nd ed. tion. Wileys & Sons Ltd, West Sussex PO19 8SQ, England, pp 3-30.

Lecture 7 L Fallowfield (2009) *What is quality of life? What is...?* Series, 2nd edition. Published by Hayward Medical Communications, Hayward Ltd Group. pp 1-7.

Lecture 7+8 Jansen et al., (2010) Develop an evaluation plan. Chapter 9. In: Haveman-Nies, Jansen, van Oers, van 't Veer (eds). *Epidemiology in public health practice.* Wageningen Academic Publishers, the Netherlands. pp 185-214.

Lecture 8 Glasgow RE et al. Evaluating the impact of health promotion programs: using the RE-AIM framework to form summary measures for decision making involving complex issues. *Health Educ Res.* 2006;5:688-694.

Lecture 8 Guyatt GH at al; GRADE Working Group. GRADE: an emerging consensus on rating quality of evidence and strength of recommendations. *BMJ.* 2008 Apr 26;336(7650):924-926.

Lecture 9 Sallis J et al. An ecological approach to creating active living communities. *Annu.Rev. Public Health* 2006;27:297-322.

Lecture 10 Petrou S, Gray A. Economic evaluation using decision analytical modelling: design, conduct, analysis, and reporting. *BMJ.*

Vereiste voorkennis

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

Doelgroep

Students with a Bachelor degree in Health Sciences.

Overige informatie

Taught in Dutch, English upon request. This course is a compulsory course within the Master specialization Prevention & public health.

Guest lectures:

Prof. dr. ir. Jantine Schuit, National Institute for Public Health and the Environment (RIVM)

Dr. Frank Pierik, Dutch Organization for Applied Scientific Research (TNO).

Health Psychology

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

Doel vak

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

1. coping with diseases;
2. compliance;
3. self-regulation;
4. communication processes between health care workers and their patients;
5. stigmatization;
6. psychosomatic disorders

Course objectives

Knowledge:

- You can explain what health psychology is;
- You have insight in 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, self-regulation, doctor-patient communication, stigmatization and psychosomatic disorders;
- 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 pitch an idea for a theory-based health psychology intervention (tertiary prevention) in under 3 minutes;
- You are able to develop a feasible intervention plan (tertiary prevention) based on intervention mapping steps 3 and 4;
- You are able to give a presentation in English on the developed intervention plan;
- You can write a short paper in English on the theory regarding a chosen 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

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

Lectures and tutorials: 12
Workgroups: 6
Patient lectures: 3
Pitch-session: 1
Presentation session: 2

Contact hours: 42 hours

Self-study time: 50 hours (amongst others approximately 5 hours per workgroup)

Assignment 1 : 40 hours

Assignment 2: 16 hours

Toetsvorm

In order to pass for the course you must:

1. Pitch your idea for an intervention plan with a colleague student;
2. Give a presentation about your elaborated intervention plan with a colleague student (pass mark is 5.5);
3. Hand in your PowerPoint slides (or other materials that you used for the presentation);
4. Attend the three guest lectures by patients;
5. Hand in your report about one of the guest lecturers before the end of the course (pass mark is 'sufficient');
6. Pass the written exam (pass mark is 5.5).

The final mark for the course is being determined by:

- the presentation (25%);
- the written exam (75%) consisting of 5 open-ended questions and 50 right/wrong questions (both counting for 50% of the mark for the written

exam);

Literatuur

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

+ articles on Blackboard!

Vereiste voorkennis

Knowledge about Intervention Mapping

Doelgroep

Msc students Health Sciences

Overige informatie

Taught in Dutch, English upon request. In that case, Notify at least two weeks beforehand, next to the regular registration. Tel.

020-5986948, e-mail: ingrid.steenhuis@falw.vu.nl.

Human Ambience Innovation

Vakcode	X_405053 (405053)
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. C.N. van der Wal
Docent(en)	dr. C.N. van der Wal
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak

The masterstudent has an overview of possible applications and current methods and techniques in the area of Human Ambience. The masterstudent can apply different modelling techniques to a design of an intelligent support system for humans. The masterstudent can make a prototype of its designed application.

Inhoud vak

This course provides an overview of possible application domains for Human Ambience and methods that can be used to create human-supporting applications within these domains. During the lectures, a number of experts in various domains (e.g., health, mental health, movement, social functioning, neuroscience) will provide background knowledge about these domains and possible applications. Thereafter, techniques and models will be discussed (first during the lectures and later by means of presentations given by students themselves) that contribute to the development of applications within these domains.

During the first four weeks (the presentations by domain experts), the student is required to write reports, in which (s)he explains in detail how Human Ambience techniques can be applied to support humans in different domains. In the next 2 weeks, the student will look into fundamental methods and techniques within Human Ambience (through lectures and reading assignments). In the last week, one domain is

selected in combination with a specific technique in which the student will perform a project.

Onderwijsvorm

Guest lectures with discussions and lectures by teacher. Presentations by students.

Toetsvorm

assignments and presentation.

Literatuur

Literature available through blackboard.

Aanbevolen voorkennis

none.

Doelgroep

mAI

Human Information Processing

Vakcode	P_MHINFOP (815048)
Periode	Periode 5
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Psychologie en Pedagogiek
Coördinator	dr. S.A. Los
Docent(en)	dr. S.A. Los
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak

Introduction to the major theories of human information processing and the experimental methods to test them.

Inhoud vak

In this course you will be familiarized with the literature on human information processing, which aims at understanding the functional architecture of processes intervening stimulus and response. Major themes include: (1) serial versus parallel organization of mental processes (2) continuous versus discrete transmission of information between consecutive processes (3) the controversy of the central bottleneck (4) the role of preparation and executive control. These themes are studied from a functional perspective: The focus is on what these processes are supposed to be doing rather than on where in the brain these processes are implemented. The dominant method in this literature is mental chronometry, which aims at making inferences on the basis of latency measures, such as response times and the onset of event-related brain potentials.

Onderwijsvorm

Lectures.

Toetsvorm

Written examination with open questions.

Literatuur

Journal articles to be specified on Blackboard.

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. K.S. Schlobach
Docent(en)	dr. K.S. Schlobach
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

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

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

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

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

as well as specific software environments, but also introduce basic concepts in project management for ICT projects.

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

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

Onderwijsvorm

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

Literatuur

Collection of papers.

Doelgroep

mAI, mCS

Information Visualization

Vakcode	X_418143 ()
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen

Intelligent Web Applications

Vakcode	X_405055 (405055)
Periode	Periode 4
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. A. Loizou
Docent(en)	dr. A. Loizou, dr. R.J. Hoekstra
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak

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

Inhoud vak

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

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

Onderwijsvorm

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

Toetsvorm

3 Individual Assignments:

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

Group project: Develop an Intelligent Web Application

Literatuur

General technical documentation, selected suggested literature.

Aanbevolen voorkennis

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

Internet programming

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

Doel vak

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

Inhoud vak

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

Onderwijsvorm

Lectures combined with lab assignments

Toetsvorm

Final exam plus lab assignments

Literatuur

Course slides

Vereiste voorkennis

Knowledge of C, Java

Aanbevolen voorkennis

Good knowledge of both C and Java

Doelgroep

mAI, mCS, mPDCS

Knowledge and Media

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

Doel vak

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

Inhoud vak

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

Onderwijsvorm

Working lectures

Toetsvorm

Portfolio

Literatuur

Articles distributed through Blackboard

Doelgroep

UvA students and optional course for mCS, mAI and mIS

Knowledge Engineering

Vakcode	X_405099 ()
Periode	Periode 2+3
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	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

Logical Verification

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

Doel vak

Introduction to the proof assistant Coq and its foundations

Inhoud vak

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

Onderwijsvorm

2 hours theory class, 2 hours practical work

Toetsvorm

Written exam and obligatory Coq exercises

Literatuur

Course notes

Vereiste voorkennis

An introduction course in logic.

Doelgroep

mCS, mAI, mMath

Overige informatie

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

Master Project

Vakcode	X_400285 (400285)
Periode	Ac. Jaar (september)
Credits	30.0

Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
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; Meeting). See blackboard KIM.

Onderwijsvorm

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

Toetsvorm

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

Doelgroep

mAI

Overige informatie

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

Master Thesis: Research Project Cognitive Science

Vakcode	P_MTHRCSC (815067)
Periode	Ac. Jaar (september)
Credits	30.0
Voertaal	Engels
Faculteit	Faculteit der Psychologie en Pedagogiek

Coördinator	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.

Mini-Master Project AI

Vakcode	X_400428 (400428)
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	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

Vakcode	R_Misd.anaC (212404)
Periode	Periode 4
Credits	6.0
Voertaal	Nederlands
Faculteit	Faculteit der Rechtsgeleerdheid
Coördinator	dr. J.J. van der Kemp
Docent(en)	drs. W.M.E.H. Beijers, dr. J.J. van der Kemp
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak

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

Inhoud vak

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

In de colleges wordt aandacht besteed aan de actuele ontwikkeling binnen de opsporing en handhaving naar informatie- en probleemgestuurd werken om het kader te schetsen van de rol die misdaadanalyse daarin speelt. Daarna komt een selectie van methoden van misdaadanalyse aan bod en worden deze voorzien van wetenschappelijke reflectie.

Achtereenvolgens zullen strategische analyses vanuit probleemgestuurd (POP-policing) perspectief en geografische analyses als HotSpots besproken worden. Meer specialistische vormen van criminaliteitsanalyse, bekend als gedragskundige analyse, als geografische en psychologische daderprofilering sluiten de reeks af.

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

Onderwijsvorm

Studenten krijgen opdrachten waarmee zij zichzelf oefenen in het toepassen van deze vormen van onderzoek en de waardering van de methoden naar de wetenschappelijke stand van zaken.

Toetsvorm

Het vak wordt getoetst aan de hand van de volgende onderdelen:

- Take home tentamen.
- Opdracht(en).

Literatuur

Wordt bekend gemaakt via Blackboard.

Overige informatie

Het vak is alleen toegankelijk voor MA Criminologie.

Mobile Systems

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

Inhoud vak

The course description is available on:

<http://studiegids.uva.nl/web/uva/sgs/en/c/8034.html>

Doelgroep

mIS

Overige informatie

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

Model-based Intelligent Environments

Vakcode	X_405056 (405056)
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. M.C.A. Klein
Docent(en)	prof. dr. J. Treur, dr. M.C.A. Klein, dr. T. Bosse
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

Multimedia Authoring

Vakcode	X_405098 ()
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. A.P.W. Eliens
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak

The course gives a practical introduction to multimedia authoring, in particular the development of rich media web applications.

Inhoud vak

In the course an extensive introduction to the use of flex/as3 (a programmatic way to produce flash applications) is given. Topics treated include the construction of visual objects, animation, interaction, asset management, positioning of objects in 2D and 3D space. Also the use of images, video and sound to augment the users experience will be treated. Ample attention will be given to the programmatic issues, including scripting and components, needed for the development of interactive applications.

The assignments include a media viewer with annotation editor, and a

rich media application of moderate complexity, dependent on the level and experience of the student(s).

Onderwijsvorm

lectures and practicum

Toetsvorm

practicum assignments

Literatuur

online syllabus

Doelgroep

mCS, mAI and interested students

Overige informatie

For course information and registration, see <http://www.cs.vu.nl/~eliens/mma>

Networked Organizations and Communication

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

Doel vak

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

Inhoud vak

The seminar Networked Organizations and Communication aims at gaining in-depth insight into the antecedents and consequences of interpersonal-, interunit-, and interorganizational networks. The seminar begins with an introduction to network theory, general terms, and concepts. On the basis of recent network literature, the seminar then focuses on how organizations and organizational members become more connected to each other (e.g., through actor similarity, communication patterns, etc.) and how this affects various outcomes (e.g., job satisfaction, innovation activities, spread of hypes, firm survival, etc.). A particular focus will thus be on gaining insights into social and semantic networks and on two software programs with which one can analyze and visualize social or semantic networks.

Onderwijsvorm

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

Toetsvorm

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

Literatuur

Series of articles to be announced on Blackboard

Vereiste voorkennis

Participation in Organization Sciences (S_OS).

Aanbevolen voorkennis

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

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

Doelgroep

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

Neural Models of Cognitive Processes

Vakcode	P_MNEUMOD (815051)
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Psychologie en Pedagogiek
Coördinator	dr. M. Meeter
Docent(en)	W. Kruijne
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak

Computational models are an important feature in cognitive neuroscience. When used appropriately, they allow for the integration of findings from a wide range of experiments, as well as detailed predictions. As opposed to many theories, they are rich in detail and allow for a mechanistic view on how the brain operates.

In this course, you will:

- > Learn about how models can enrich the field of cognitive neuroscience
- > Gain insight into different types of models, their strengths and weaknesses
- > Obtain in-depth knowledge about several specific models
- > Get hands-on experience with a variety of models

Inhoud vak

The course starts with a general introduction on models within the field of cognitive neuroscience, and getting familiar with the software used in the practical sessions. Then, you will learn about some prototypical neural models, and their applications within (and beyond) your field. The practical sessions will have you explore the inner workings of these

models, by means of exercises and essay questions.

In the second half of the course, you will learn about a wider variety of models, with different levels of abstraction. Furthermore, you will dive into (and present) articles where models, inspired by the prototypical ones discussed in the lectures, have been applied in cognitive neuroscience.

Onderwijsvorm

Lectures and discussion, computer tutorial and practicals, one oral presentation.

Toetsvorm

Grades are based on a weighted average of performance on a final exam, the oral presentation and the practical sessions.

Literatuur

articles, tutorials and other reading material on blackboard

Overige informatie

Period: 2 (in 13-14, not in 14-15)

Neurale Netwerken

Vakcode	X_400132 (400132)
Periode	Periode 1
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, Practicum
Niveau	500

Doel vak

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

Inhoud vak

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

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

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

Onderwijsvorm

Lectures and compulsory programming assignments.

Toetsvorm

Programming assignments and written examination (weighted average).

Literatuur

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

Doelgroep

mAI mBio, mBA, mCS

Overige informatie

More information will be available via Blackboard.

Ondernemerschap en innovatie, een relationeel perspectief

Vakcode	S_OIRP ()
Periode	Periode 2
Credits	6.0
Voertaal	Nederlands
Faculteit	Faculteit der Sociale Wetenschappen
Docent(en)	prof. dr. P. Groenewegen, J.M. Birkholz, dr. I.A.M. Wakkee
Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	500

Doel vak

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

- Hebben deelnemende studenten kennis en inzicht verworven in ondernemerschap en innovatie van een relationeel perspectief
- Zijn zij in staat om
- Te reflecteren op de toepassing van relevante netwerk concepten op praktijk gevallen (cases) van ondernemerschap en innovatie
- Een praktijk probleem te vertalen naar onderzoekbare vragen
- Sociale netwerk concepten en bijbehorende onderzoeksmethoden toe te passen in kleinschalig empirisch onderzoek
- Mondeling en schriftelijk te rapporteren over de toepasbaarheid van sociaal netwerk onderzoek op de uitdaging van innovatie en ondernemerschap (organisationale vernieuwing)

Inhoud vak

In dit vak wordt aandacht besteed aan hedendaagse vraagstukken met betrekking tot vernieuwing van en in organisaties. Ondernemerschap wordt hier gezien als het najagen van kansen ongeacht de beschikbare middelen. Daarmee wordt afgeweken van de meer strategische benaderingen van organisatievraagstukken die uitgaan van optimale inzet van beschikbare middelen. Naast aandacht voor verschillende vormen van ondernemerschap en innovatie binnen organisaties zal er ook aandacht worden geschonken aan de rol van samenwerkingsverbanden tussen verschillende soorten organisaties. Gezien het belang van ondernemerschap en innovatie en het veelvuldig voorkomen van samenwerking binnen deze sectoren is er gekozen om specifieke aandacht te schenken aan de sectoren zorg, life sciences en renewable energy.

Onderwijsvorm

Het vak bestaat uit drie delen. Het eerste deel (6 bijeenkomsten) bestaat uit een serie hoor en discussiecolleges waarin de verplichte literatuur wordt besproken. Studenten dienen ter voorbereiding op deze colleges de verplichte literatuur horende bij dat college kort en bondig (max 1 A4) te parafaseren waarbij de nadruk ligt op het bespreken van de kernconcepten en de koppeling tussen probleem en gehanteerde methode. Een aantal studenten zal tijdens de bijeenkomsten worden gevraagd hier een mondelinge toelichting op te geven. Het gemiddelde cijfers voor de 6 parafrases tellen mee voor 40% van het eindcijfer. Het tweede deel bestaat uit de voorbereiding van een klein empirisch onderzoek naar keuze (formulering van een vraagstelling en ontwikkeling methode) gericht op een (praktisch) relevant vraagstuk over ondernemerschap en innovatie in de zorg, in de life science of in de renewable energy sector. Hiertoe schrijven de studenten in kleine groepjes een kort onderzoeksvoorstel. Het onderzoeksvoorstel dat in duo's of trio's wordt voorbereid telt voor 20% mee in het eindcijfer. Ter ondersteuning worden in een drietal workshops, verschillende methoden en technieken van netwerkonderzoek besproken in relatie tot de voorgestelde onderzoeksideeën. Deel drie bestaat uit het uitvoeren (in duo's of trio's) van het empirische deel van het onderzoek en wordt afgesloten met een kort en bondig adviesrapport aan de organisatie alsmede met een presentatie. Studenten kunnen in maximaal 2 keer langskomen voor een korte feedbacksessie met de docent. Het eindrapport telt voor 40% mee in het eindcijfer voor dit vak. De presentatie van dit rapport kan maximaal een half punt bonus of aftrek voor dit onderdeel opleveren.

Aanwezigheid tijdens alle bijeenkomsten van deel 1 is verplicht. Studenten die een of meerdere bijeenkomsten missen moeten (ongeacht de reden) dienen een relevante compenserende opdracht te vervullen die samenhangt met het thema van de bijeenkomst.

Toetsvorm

Continue assessment aan de hand van individuele en groepsopdrachten

Literatuur

De literatuur die in dit vak gebruikt wordt zijn (recente) artikelen;

- Acs, Z. J., & Audretsch, D. B. 2005. Entrepreneurship and innovation. Discussion Papers on Entrepreneurship, Growth and Public Policy, 2105. <http://www.econstor.eu/bitstream/10419/20011/1/2005-21.pdf>
- Ahuja, G. 2000. Collaboration Networks, Structural Holes, and Innovation: A Longitudinal Study. Administrative Science Quarterly, 45 (3): 425-455.
- Borgatti, S. P., Mehra, A., Brass, D. J., & Labianca, G. 2009. Network

analysis in the social sciences. Science, 323(5916), 892-895.

- Burt, R. S. 2000. The network structure of social capital. Research in Organizational Behavior, 22: 345-423.

- Hoang, H. and Antoncic, B. (2003). Network-based research in entrepreneurship: a critical review. Journal of Business Venturing, 18, 165-187

- Lechner, C.; Dowling, M. 2003. Firm networks: external relationships as sources for the growth and competitiveness of entrepreneurial firms Entrepreneurship & Regional Development 15(1), 1 – 26

- Lipparini M. A. 1994. The glue and the pieces: Entrepreneurship and innovation in small-firm networks* 1. Journal of Business Venturing, 9 (2): 125-140.

- Obstfeld, D. 2005. Social networks, the Tertius iungens orientation and involvement in innovation. Administrative Science Quarterly, 50(1): 100-130. nb this article is also part of the required literature of the course Networked Organizations.

- Peters, L., Groenewegen, P., & Fiebelkorn, N. 1998. A comparison of networks between industry and public sector research in materials technology and biotechnology. Research Policy, 27(3): 255-271

- Powell, W. and Grodal, S. (2005) 'Networks of Innovators'(eds.) Fagerberg, J., Moverly, D. and Nelson, R. The Oxford Handbook of Innovation, Oxford University Press, Oxford, chapter 3 pp56-85

- Rost, K. 2011. The strength of strong ties in the creation of innovation. Research Policy, 40(4): 588-604. Hallen, B. L. 2008. The Causes and Consequences of the Initial Network Positions of New Organizations: From Whom Do Entrepreneurs Receive Investments? Administrative Science Quarterly, 53(4), 685-718.

- Zhao, F. 2005. Exploring the synergy between entrepreneurship and innovation. International Journal of Entrepreneurial Behaviour & Research, 11(1): 25-41.

Vereiste voorkennis

Deelname aan Organization Sciences (S_OS).

Doelgroep

Master studenten BCO Organisatie en Omgeving (verplicht), BCO Zorg (keuzemogelijkheid) en SBI (keuze mogelijkheid)

Operating Systems

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

Doel vak

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

Inhoud vak

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

Onderwijsvorm

Lectures

Toetsvorm

Written exam

Literatuur

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

Overige informatie

Students who have included the course Bedrijfssystemen (X_400011) in their Bachelor's program must not follow this course for their Master's program.

Parallel Programming for High-performance Applications

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

Inhoud vak

This lecture discusses how programs can be written that run in parallel on a large number of processors, with the goal of reducing execution time. The class has a brief introduction into parallel computing systems (architectures). The focus of the class, however, is on programming methods, languages, and applications. Both traditional techniques (like message passing) and more advanced techniques (like parallel object-oriented languages) will be discussed. Several parallel applications are discussed, including N-body simulations and search algorithms. About 4-5 lectures are devoted to an important new development: programming many-core machines such as Graphical Processing Units (GPUs). The class fits well with existing research projects within the department of Computing Systems. It is a good basis for M.Sc. projects in the area of parallel programming, which use the parallel computing systems of the department.

Onderwijsvorm

Class with separate practicum (6 ECTS).

Toetsvorm

Written exam.

Literatuur

To be announced.

Vereiste voorkennis

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

Doelgroep

mAI, mBIO, mCS, mPDCS

Perception

Vakcode	P_MPERCEP (815047)
Periode	Periode 5
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Psychologie en Pedagogiek
Coördinator	dr. W. Donk
Docent(en)	dr. W. Donk
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak

To familiarize students with various approaches to studying perception.

Inhoud vak

Introduction to the fundamental principles of perception. Physiological, psychophysical and cognitive approaches to visual, auditory and tactile perception are treated. Is perception purely a registration of the outside world? Which processes and representations underlie conscious and unconscious perception? What methods can we use to find out?

Onderwijsvorm

Lectures, literature study

Toetsvorm

Written examination: open end questions

Literatuur

Goldstein, E.B. Sensation and Perception. 8th Edition. London: Wadsworth.

Selected readings (to be announced in class)

Perception for Action

Vakcode	B_PERCACTION (900810)
Periode	Periode 4
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Bewegingswetenschappen
Coördinator	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 and apply it to the field of motor control.

Inhoud vak

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

Onderwijsvorm

Amount of contact hours:

Lectures (' hoorcolleges') 7

Tutorials (' werkcolleges') 7

Assignments & self study 68

Practicals 2

Each meeting will be a combination of tutorial consisting of a discussion of the previous assignment (1 hour), and a lecture introducing to the topic of the next assignment (1 hour)

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

Toetsvorm

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

Literatuur

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

Vereiste voorkennis

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

Overige informatie

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

Prevention of Mental Health Problems

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

Doel vak

To obtain theoretical and practical knowledge about preventive mental health care

Inhoud vak

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 prevention programs. Also, the most important results of research conducted in the field of preventive mental health care will be presented. After following the course, students will be acquainted with the latest scientific insights as well as practice in the Netherlands regarding the prevention of mental health problems. Examples of topics are the prevention of depression and cognitive behavioral therapy.

Onderwijsvorm

Lectures, guest lectures, tutorials/discussion of study materials, self study, writing a project plan

Toetsvorm

Written exam (60%) and project plan (40%)

Literatuur

Reader

Aanbevolen voorkennis

- Basic knowledge psychopathology (symptoms of different psychiatric disorders)
- Basic knowledge on etiology, diagnostic processes and treatments
- Basic knowledge on role of mental health from public health perspective
- Basic knowledge on what prevention programs are and how they are developed
- Academic writing and reading skills

Doelgroep

MSc students Health Sciences, MSc students Clinical Psychology

Overige informatie

Taught in Dutch, English upon request. Notify at least three weeks beforehand.

Research Methods

Vakcode	X_405085 ()
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Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. J.M. Akkermans
Docent(en)	prof. dr. J.M. Akkermans
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 conceptualize the problem space at hand and formulate a clear research question in the field of information studies, information sciences or AI
- is able to find, analyse and critically reflect on and use scientific literature relevant to the research context
- is able to design a research plan containing applicable research methods, covering qualitative, quantitative and constructive elements typical to the field
- is able to defend his research design with solid argumentation explaining the underlying assumptions, pros and cons etc. of the chosen methods.
- is able to collect and process the research data and to critically judge the obtained results in relation to the research questions
- is able to describe and critically discuss the above activities in a written report, in which the methodology is accounted for and the original phrasing is substantiated
- is able to present and discuss the results to a scientific audience

Inhoud vak

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

Topics are:

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

Onderwijsvorm

In addition to lectures on various aspects of and issues in research methodology, students will get hands-on experience with different

research methods. The setting of the practical work is that of a continuing research case investigation that emulates the different stages of a scientific research project. The research case question to be investigated is: What is it for systems to be considered "smart" or intelligent"?

Toetsvorm

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

Literatuur

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

Vereiste voorkennis

Basic knowledge of qualitative and quantitative research methods.

Doelgroep

mAI, mIS

Review Paper

Vakcode	P_MREVPAP (815104)
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Psychologie en Pedagogiek
Coördinator	dr. R.J. Godijn
Docent(en)	dr. R.J. Godijn
Lesmethode(n)	Hoorcollege
Niveau	500

Doel vak

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

Onderwijsvorm

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

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

Science and Society in a Hist. Persp.

Vakcode	X_400424 (400424)
Periode	Periode 5
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. D.J. Beckers
Docent(en)	dr. D.J. Beckers

Doel vak

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

Inhoud vak

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

Onderwijsvorm

seminar.

Toetsvorm

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

Literatuur

available via blackboard.

Vereiste voorkennis

introduction history of science

Aanbevolen voorkennis

in possession of a Bachelor degree

Doelgroep

mFEW, mFALW, history

Overige informatie

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

Seminar Attention

Vakcode	P_MSEMATT (815100)
Periode	Periode 3
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Psychologie en Pedagogiek
Coördinator	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 and is required to find a recent paper on the topic covered by the target article. Students have to prepare a 20 minute oral presentation in Microsoft Powerpoint. The rest of the class will be spent discussing the target articles and their relationship to the presented papers. Each student will give two presentations. The presentation will determine 30% of the course grade for each student. The target papers will be available on the course website and accessible via blackboard. One week after the last class, each student will submit a final paper (up to 8 pages, 12 pt. font, double spaced) on one of the topics covered in class. The paper will consist of a brief review of (at least) 6 research papers (including those already covered on that topic in class) and a proposal for a new experiment. The paper will be worth 40%. Each class all students have to turn in a sheet of paper with a short question/remark about one of the papers discussed during that class (30% of the grade). Students will receive an introduction into the arts of oral presenting and of writing an essay as a preparation to the assignments.

Onderwijsvorm

Lectures and practical assignments.

Toetsvorm

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

Literatuur

Articles.

Seminar Cognitive Neuroscience

Vakcode	P_MSEMCNS (815098)
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Psychologie en Pedagogiek
Coördinator	dr. A.V. Belopolskiy
Docent(en)	dr. A.V. Belopolskiy
Lesmethode(n)	Hoorcollege

Niveau	500
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Doel vak

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

Inhoud vak

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

Onderwijsvorm

Lectures, literature study, oral presentations and discussions.

Toetsvorm

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

Literatuur

Research papers to be announced.

Overige informatie

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

Service Oriented Design

Vakcode	X_405061 (405061)
Periode	Periode 1
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. P. Lago
Docent(en)	dr. P. Lago
Lesmethode(n)	Hoorcollege, Werkcollege
Niveau	400

Doel vak

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

Inhoud vak

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

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

Onderwijsvorm

Lectures and group work.

Toetsvorm

Written reports of the assignments. Teamwork.

Literatuur

Material handed out by the lecturer and on Blackboard.

Aanbevolen voorkennis

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

Doelgroep

mAI, mCS

Overige informatie

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

Software Architectuur

Vakcode	X_400170 (400170)
Periode	Periode 2
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	prof. dr. J.C. van Vliet
Docent(en)	prof. dr. J.C. van Vliet
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak

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

Inhoud vak

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

Onderwijsvorm

Group work with a number of assignments

Literatuur

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

Doelgroep

mCS, mIS

Software Testing

Vakcode	X_400439 (400439)
Periode	Periode 4
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. N. Silvis-Cividjian
Examinator	dr. N. Silvis-Cividjian
Docent(en)	dr. N. Silvis-Cividjian
Lesmethode(n)	Hoorcollege, Practicum
Niveau	400

Doel vak

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

Inhoud vak

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

This course provides an introduction to software testing with an emphasis on technical activities like test generation, selection, execution and assessment. The course tries to answer a few questions like: How to design test cases? When to stop testing? What to test when a new version of the product is ready? How to test a safety critical software? How to predict how many faults are in a program? During their practical assignments the students have to test small and large object-oriented software using the techniques learned in class and a set of testing tools.

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

Topics: boundary value analysis, equivalence partitioning, decision table testing, combinatorial test design, control flow testing, data flow testing, mutation testing, regression testing, inspections, safety and reliability testing, fault and failure prediction.

Onderwijsvorm

Lectures and compulsory practical assignments.

Toetsvorm

Practical assignments and written exam.

Literatuur

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

Aanbevolen voorkennis

Programming skills in Java

Doelgroep

mCS, mAI

Overige informatie

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

Spatial Criminology

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) Students are able to perform basic spatial criminological analyses as well as create crime maps using freeware software like Qgis and CrimeStat;
- (3) Students are able to interpret and discuss results from spatial analyses.

Inhoud vak

In this course the basic principles of Crime Mapping using a geographic information system (GIS) and spatial 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 social cohesion. How this can be investigated and with

which methods of spatial analysis can be used in this section is discussed. A number of different analytical methods are taught and practiced by assignments during the labs and during the final research project on a spatial crime problem.

Onderwijsvorm

As this course is hands-on students are required to attend each meeting. The use of a laptop is required.

Each practical has room for 28 students. Participation in the practicals is mandatory.

Toetsvorm

The course will be assessed by the following components:

- Paper(s).
- Presentation(s).

Literatuur

TBA

The Social Web

Vakcode	X_405086 ()
Periode	Periode 4
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Exacte Wetenschappen
Coördinator	dr. L.M. Aroyo
Docent(en)	dr. L.M. Aroyo, V. Maccatrozzo MSc, C.R. Dijkshoorn MSc
Lesmethode(n)	Hoorcollege
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 assignments and final paper

Literatuur

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

Doelgroep

VU: mIS

UvA: master Information Studies - Human-Centered Multimedia

mCS

mAI

Thinking and Deciding

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

Doel vak

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

Inhoud vak

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

Onderwijsvorm

Lectures, literature study, oral presentations and discussion.

Toetsvorm

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

Literatuur

A selection of articles and book chapters.

Veiligheid en burgerschap

Vakcode	S_VB ()
Periode	Periode 2
Credits	6.0
Voertaal	Nederlands
Faculteit	Faculteit der Sociale Wetenschappen
Coördinator	dr. R. van Steden
Docent(en)	dr. R. van Steden, prof. dr. J.C.J. Boutellier

Lesmethode(n)	Hoorcollege, Werkgroep
Niveau	500

Doel vak

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

Inhoud vak

Het programma biedt studenten kennis over de volgende thematieken:

- Sociale (on)veiligheid;
- Criminogeniteit en strafrecht;
- Veiligheid en publieke moraal;
- Veiligheidsbeleving en veiligheidsbeleid;
- Veiligheidsnetwerken en 'nodale orde';
- Sturing van lokale veiligheid;
- Pluriforme politiefunctie (plural policing);
- Veiligheid en burgerparticipatie;
- Maatschappelijke gevolgen van het huidige veiligheidsstreven;
- Veiligheid en burgerschap.

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

Onderwijsvorm

Hoor- en werkcolleges met verplichte aanwezigheid.

Toetsvorm

Open boek tentamen

Literatuur

Wordt nog bekend gemaakt.

Aanbevolen voorkennis

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

Doelgroep

Masterstudenten Bestuurskunde, afstudeerrichting BvV