



Research Variant Cognitieve Science

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

General information

One of the programmes within the master Artificial Intelligence (AI) is that of Cognitive Science. To gain access to Cognitive Science you need a Bachelor Degree in Psychology, preferably within the area of Cognitive Psychology, or a Bachelor Degree in Artificial Intelligence. Alternatively, you can enroll with a Bachelor Degree in Neuroscience, Physics, Mathematics, Biology, Philosophy, Medicine, or Computer Science, provided you have an appropriate specialization. A Bachelor Degree in Clinical and Cognitive Neuropsychology or in Artificial Intelligence obtained at the VU guarantees admittance to Cognitive Science.

Cognitive Psychology involves research in the areas of perception, attention, memory, learning, action, decision, and thinking. The major aim is to understand the processes that underlie human functioning. The research activities of the Department of Cognitive Psychology have a strong focus on visual and auditory perception, attention, and eye movements.

Goals of the Program

The programme focuses on the processes that underlie human functioning from two different research perspectives: empirical work and computational modelling. The combination of these two perspectives allows for a better understanding of the mechanisms underlying human functioning. For example, empirical work may suggest a functional layout for computation models, and vice versa, results of simulations with computation models can provide suggestions for setting up specific experiments. The underlying philosophy of Cognitive Science at the VU is to challenge students to be knowledgeable in a wide variety of fields and techniques, all of which are related to the subject area of cognitive psychology.

Cognitive Science is jointly organized by the Department of Cognitive Psychology of the Faculty of Psychology and Education, and the Department of Artificial Intelligence of the Faculty of Sciences. Cognitive Science is a two-year Master allowing students to obtain a Master of Science (MSc).

Academic calendar 2012-2013

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.

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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

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.

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

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;

Comparative Modeling

Vakcode	X_405091 ()
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

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/>)

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

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 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

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.

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

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)

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)

Research Methods

Vakcode	X_405085 ()
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
Lesmethode(n)	Hoorcollege, Werkcollege

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

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.

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.