# Course Guide – Master Cognitive Science

**Summer 2017**

**Last update: 30.03.2017**

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### Second Year Program

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## Enrollment for Courses

Students in the first semester will be registered by the lecturers in the first session of each course. Advanced students (from the second semester on) are requested to register with the university’s VSPL-system (info: vspl-support@rub.de) and should be aware of earlier VSPL-deadlines. **Exceptions** include the courses held by Wiskott, Schöner and Würtz. Here, there will be **no VSPL-registration**, but a manual enrollment in the first session.

Please notice that one and the same course can only be used to be part of one module for each student. Double use of the same course is not allowed.
In the last two decades, moral philosophy has been subject of increasing interest from researchers in psychology, anthropology, sociology, and other related fields. This research yielded surprising results about how people actually make moral judgments, which sometimes stand in sharp conflict to normative philosophical accounts.

However, to adequately engage with such presumably challenging evidence, philosophers need to be enabled to understand and critically evaluate empirical papers. The aim of this seminar is to provide advanced bachelor and master students with the necessary tools to do so, starting from experimental design and moving on to statistical analyses and interpretation of those analyses.

A variety of papers in moral psychology will provide examples of how empirical research has been used to achieve philosophical progress. In addition, we will contrast those papers with critical reviews that claim to have identified serious methodological flaws that render the results questionable.

As an alternative to classical philosophy essays, students will be given a chance to write an empirical essay in which they conduct own text-based experiments on a clearly defined philosophical question.
Moral thinking pervades our practical lives, but where does it come from? Is there an innate basis to human morality or is it a cultural phenomenon? Can we give a plausible evolutionary account of our sense of morality? What purpose does this sense of morality serve? What does that mean for the normative status of our moral judgments? Can this evolutionary perspective help to answer to moral skepticism? Or does an adaptive explanation of morality in terms of genetic success (“if it is just something that helped our ancestors make more babies”, as Joyce writes) rather undermine morality’s central role in our life? In this seminar we’ll discuss these question on the basis of Richard Joyce’s 2005 book The evolution of morality. The language of the seminar is English.
In this seminar, we will explore situated views of cognition. These are sometimes called ‘4E’ views, the four ‘E’s standing for ‘extended’, ‘embedded’, ‘embodied’, and ‘enactive’ - though in this course, we will focus primarily on the first three. Generally speaking, the situated view of cognition emphasizes the contribution of the environment and the nonneural body to cognitive processing. Situated theorists typically take exception to an image of the human mind as an isolated computer, an image commonly associated with the early days of cognitive science and pioneering work in artificial intelligence. Instead of a computer that is programmed to search systematically through a range of well-defined options, the situated theorist sees human cognitive achievements as the product of an ongoing dynamical dance, a messy multiplicity of real-time interactions between the brain, body, and world. This description of the situated approach is somewhat metaphorical, and thus we will spend much of the semester examining, and attempting to evaluate the import of, the more detailed philosophical and empirical claims associated with the situated view. We will be especially concerned with the ways in which situated approaches bear on claims regarding the nature and location of cognition itself. We will ask what kind of property ‘being cognitive’ is and what sorts of entities can be cognitive. This seminar is closely related to the new Research Training Group for PhDs in Philosophy and Cognitive Science. It enables students to work out a master thesis in this research area which will be fostered at least for the next four and half years.

Certificates:

Students in Philosophy:
(i) Certificate without grade: oral presentation with handout and power point.
(ii) Certificate with grade: Oral presentation and a 15 page research paper on a topic related to situated cognition.

Students in Cognitive Science:
Graded certificate: Oral presentation and a 10 page research paper on a topic related to situated cognition or oral exam of 30 minutes (details have to be arranged).

Textbook:
Reading material for the course will be distributed electronically.
**Neuroinformatics** is concerned with the discovery of new solutions to technical problems of information processing. These solutions are sought based on analogies with nervous systems and the behaviour of organisms. This course focuses on three exemplary problems to illustrate this approach:

(a) Artificial action (autonomous robotics);
(b) Artificial perception (robot vision);
(c) Artificial cognition (simplest cognitive capabilities of autonomous robots such as decision making, memory, behavioural organization).

The main methodological emphasis is on nonlinear dynamical systems’ approaches and dynamic (neural) fields.

**Lecture & Exercise**

**Autonomous Robotics: Action, Perception, and Cognition**

(310 501 & 310 511)

**Prof. Gregor Schöner**

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<td>Thursday, 14.15 – 16.00 (First Meeting: 20.04.2017)</td>
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In the most general way of speaking, people use the noun “memory” to refer to instances where information of the past is made available for present purposes. Making available information of the past for present purposes is also the function of certain psychological states of humans and animals that we refer to by the noun “memory”. Memory has an inherent epistemological status as a source of knowledge as well as particular phenomenological quality as a certain form of re-experiences. It seems to be a mental time travel into the past. In the seminar we will discuss recent philosophical approaches to memory, dive into the history of the philosophy of memory and relate the philosophical accounts to psychological and neuroscientific research. We will also ask how to taxonomize the domain of memories and if memory is a natural kind.

Aside from active participation, participants will be expected to give a presentation in English. Assistance regarding the English language will be provided.

Readings:

This lecture presents models of self-organization in neural systems, in particular addressing vision (receptive fields, neural maps, invariances, attention) and associative memory (Hopfield network).
When we remember events from our lives, whether they are the once-in-a-lifetime or everyday kind, we use our episodic memory. Although a small region of the brain called the hippocampus was identified to be important for episodic memories a long time ago, the nature and neural basis of episodic memory remain unclear. This class will employ a novel, highly interactive format to introduce the students to the cutting edge of the research into episodic memory. Students will be involved in choosing the literature discussed in class and discuss their views with an invited speaker who will also give a scientific talk.
Im entorhinalen Cortex von Tieren und Menschen wurden "grid cells" (Rasterzellen) nachgewiesen, die eine zentrale Rolle für die räumliche Navigation und möglicherweise auch für das Gedächtnis spielen. Für die Entdeckung dieser Zellen wurde 2014 der Nobelpreis verliehen. Sie können direkt nur tierexperimentell untersucht werden, aber indirekt auch beim Menschen mittels fMRT. In diesem Diskurs sollen anhand ausgewählter Artikel die Mechanismen und Funktionen von grid cells diskutiert werden.
Lecture concerning the cognitive neuroscience of memory. Critical discussions of central topics is a main goal of this lecture and will be part of the grading.

This lecture alone is part of module C3. To be accepted for the Module "Advanced Methods" AM5, this lecture must be combined with the seminar "Cognitive Neuroscience (see announcement under AM5). Please note that one and the same course can only be used in one module in your study plan.
Negation and negativity are key features of human languages. While negation is a phenomenon of semantic opposition, negativity addresses a broader spectrum of phenomena. The investigation of the form and meaning of negation and negativity in natural language is at the heart of many debates in philosophy, linguistics, logic and psychology. It has been observed that sentences containing a negation are harder to process than affirmative sentences. This raises the question of how the meaning of negative sentences is composed and how negation and negative concepts are mentally represented. The standard theory of linguistic understanding and of meaning in the area of philosophy, linguistics and cognitive sciences has been shaped by Jerry Fodor’s notion of a Language of Thought: linguistic meaning and understanding is anchored in an internal language-like structure which allows for amodal, symbol-based information processing. This view is challenged by the embodied emulative view of linguistic meaning and understanding. Negation provides an interesting test case for the investigation and comparison of both theories.

The aim of the block seminar is to discuss various aspects of negation and its use in natural language from an interdisciplinary point of view. The core features of the two linguistic theories will be introduced. We will consider empirical data investigating the comprehension of negative sentences. Before entering into empirical research an introduction to the methods used in the selected papers will be given.

As part of the class we will host a workshop with a number of renowned international scholars, including among others Rachel Giora (Tel Aviv University), Laurence Horn (Yale University), Barbara Kaup (University Tübingen), and João Marcos (Federal University of Rio Grande do Norte).

Aside from active participation, participants will be expected to give a presentation in English. Students are requested to attend the pre-meeting for assigning topics of student presentations on 10 April at 15:15 in GA 04/43. More information about the workshop can be found at http://www.ruhr-unicbochum.de/phil-lang/Negation.html.

References:
In the research colloquium current topics at the interface between Philosophy and Cognitive Science will be discussed. In this seminar we focus on the investigation of language and cognition. The colloquium hosts talks by visiting leading experts and local researchers as well as presentations by doctoral and master students. Students will be given the (assisted) opportunity to present their projects in English.
AM. Advanced Methods

Advanced methods are usually studied in the second semester. One exception is the "FMRI"-course which is only offered in the winter. Students who already have basic knowledge in cognitive neuroscience can choose to learn the "FMRI"-technique in the first semester. Necessary background: basic knowledge in cognitive neuroscience. The FMRI-seminar must be integrated into the course program during the first or the third semester; in the case you want to learn the FMRI –technique in the first semester, an individual application for the course is necessary: boris.suchan@rub.de.

The laboratory-class “Neural substrates of memory function” is a flexible whole day course that can be integrated whenever a student is free to do so; usually it only makes sense in the semester breaks. Further advanced methods can be found in the program from the last summer semester on our webpage: http://www.ruhr-uni-bochum.de/philosophy/mcs/program_courses.html. They will again be offered in the upcoming summer semester.
In the last two decades, moral philosophy has been subject of increasing interest from researchers in psychology, anthropology, sociology, and other related fields. This research yielded surprising results about how people actually make moral judgments, which sometimes stand in sharp conflict to normative philosophical accounts.

However, to adequately engage with such presumably challenging evidence, philosophers need to be enabled to understand and critically evaluate empirical papers. The aim of this seminar is to provide advanced bachelor and master students with the necessary tools to do so, starting from experimental design and moving on to statistical analyses and interpretation of those analyses.

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In this seminar, we will explore situated views of cognition. These are sometimes called ‘4E’ views, the four ‘E’s standing for ‘extended’, ‘embedded’, ‘embodied’, and ‘enactive’ - though in this course, we will focus primarily on the first three. Generally speaking, the situated view of cognition emphasizes the contribution of the environment and the nonneural body to cognitive processing. Situated theorists typically take exception to an image of the human mind as an isolated computer, an image commonly associated with the early days of cognitive science and pioneering work in artificial intelligence. Instead of a computer that is programmed to search systematically through a range of well-defined options, the situated theorist sees human cognitive achievements as the product of an ongoing dynamical dance, a messy multiplicity of real-time interactions between the brain, body, and world. This description of the situated approach is somewhat metaphorical, and thus we will spend much of the semester examining, and attempting to evaluate the import of, the more detailed philosophical and empirical claims associated with the situated view. We will be especially concerned with the ways in which situated approaches bear on claims regarding the nature and location of cognition itself. We will ask what kind of property ‘being cognitive’ is and what sorts of entities can be cognitive. This seminar is closely related to the new Research Training Group for PhDs in Philosophy and Cognitive Science. It enables students to work out a master thesis in this research area which will be fostered at least for the next four and half years.

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Graded certificate: Oral presentation and a 10 page research paper on a topic related to situated cognition or oral exam of 30 minutes (details have to be arranged).

Textbook:
Reading material for the course will be distributed electronically.
This course will offer an introduction to the modal logic(s) of knowledge for multiple agents, and study the interactions of knowledge with other notions like beliefs and actions (especially perception and communication).

If time permits, after these core topics we will present an overview of related topics: belief change, awareness, justification, etc.

Epistemic logic is an important branch of modal logic, with applications in philosophy, computer science (artificial intelligence, multi-agent systems) and cognitive science and psychology. Inspired by Plato’s analysis of knowledge as “true, justified belief”, epistemic logic typically focuses on the “true belief” part to analyze different scenarios. Using possible world semantics, this analysis leads to a simple notions of knowledge and belief whose logics (S5 and KD45, resp.) are considered standard in the area of computer science, but that have also been challenged on philosophical grounds, as failing to distinguish between sources of knowledge, or to account for the interaction between knowledge and belief in a satisfactory way. In the first part of the course, we will introduce these two standard logics and discuss these challenges and possible solutions.

The aim of epistemic logic is to represent and reason about the knowledge that agents have about the world (e.g. “I know it rains”) and also about each other’s knowledge (e.g. “I know that you know that I know it rains”). Using relational structures, the knowledge of an agent is in fact encoded by the different possibilities considered by this agent at/about the present time. One can thus see epistemic logic as describing the knowledge that obtains in a given static scenario. If this logic is extended with a dynamic component for actions or events, one can also represent and reason about the knowledge that an agent will have in the future, after some events take place or some actions are executed. To this end, in the second part of this course, we will introduce dynamic epistemic logic, which extends the epistemic representations from states to actions (action models), and uses them to update the agents’ knowledge before the action into their knowledge after the action.

Literature:

The literature for the course will be discussed in the first session.
Neuromodulation is the process in which several classes of neurotransmitters in the nervous system regulate diverse populations of neurons. In recent years, there has been a considerable increase in interest in how cognition is shaped by neuromodulation and the key roles of several transmitter systems were identified. This course is intended to review and discuss state-of-the-art developments in neuromodulation, covering issues like neural entrainment [neurofeedback, binaural beats, transcranial alternating current stimulation (tACS)], the role of dopamine in executive functions and norepinephrine in visual attention. The final grade will be based on individual student presentation, writing a scientific blog (example: http://www.libcblog.nl/articles/flexibility-and-persistence-a-trade-off-fit-for-robots) and writing a review article (example: http://journal.frontiersin.org/article/10.3389/fpsyg.2015.01890/abstract). The best blog will be published online. The course will be given as a block course over one weekend. The course language is English. All assignments will be checked for plagiarism. Plagiarism is a form of fraud and entails violating the intellectual property of someone else. Plagiarism means you take words, thoughts, analyses, reasoning, images, that belong to someone else and present them (knowingly or not) as your own. Since plagiarism is cheating, and because plagiarism by definition undermines the scientific enterprise, cases of plagiarism are taken very seriously by the university community and are punishable by sanctions.
This course covers mathematical methods that are relevant for modeling and data analysis. Particular emphasis will be put on an intuitive understanding as is required for a creative command of mathematics. The following topics will be covered: Functions, Hilbert-Spaces, matrices as transformations, systems of linear differential equations, qualitative analysis of nonlinear differential equations, Bayes theory, multiple integrals.
Lecture concerning the cognitive neuroscience of memory. Critical discussions of central topics is a main goal of this lecture and will be part of the grading.

To be accepted for the Module "Advanced Methods" AM5, this lecture must be combined with the seminar "Cognitive Neuroscience". If you want to participate in the lecture alone, then the lecture can only be accepted as part of module C3.
This is a two-week practical course on single-cell electrophysiology. The aim of the course is to gain a practical understanding of this method. The course will briefly cover the three major topics of neurophysiology.

First, electronics. We will work with the basic electronics that are used for neurophysiological recordings (e.g. event-timing, amplification, filtering).

Second, neurophysiological recordings. Here we will record action potentials of single neurons from an invertebrate.

Third, analysis. We will program basic analysis of our own data. Analysis will be programmed in Matlab, a basic understanding of Matlab syntax is highly recommended.
This course will be held in German language, but there will be a second group in English language, if there are enough interested students. So if you would like that to happen, please apply early.

In dem Projektseminar nehmen die Studenten an einem Forschungsprojekt teil und gewinnen hierbei Einblick in die Versuchsdurchführung, Datenanalyse und -interpretation. Im Vordergrund steht dabei die Einführung in die Programmierung mit Matlab, die in wöchentlichen Sitzungen stattfinden und von zeitintensiven Hausaufgaben begleitet sein wird. Zusätzlich werden die Studenten eigene Versuche durchführen und diese dann mit ihren neu gewonnenen Programmierkenntnissen in Matlab auswerten. In einem separaten Blocktermin werden die Studenten das Projekt auch inhaltlich erarbeiten. Am Ende sollen alle drei Aufgabenbereiche in einem Bericht zusammenlaufen, in dem die inhaltlichen Aspekte des Projekts, die erhobenen Daten und deren Auswertung beschrieben werden.

Rückfragen bitte an: roland.pusch@rub.de/christoph.fraenz@rub.de
Raum: Medienraum GAFO 04/615 Do, 16.00 - 18.00, plus Blockveranstaltung (am Wochenende).
Dear students,

concerning EEG-courses, please make early decisions and contact the lecturers running the courses: Please notice the entry conditions of the courses.

There are three levels with which you can study the EEG-method.

1. If you want to be intensely informed about EEG method but do not plan to use it for the master thesis project, then it is recommended that you participate in seminar 2 only (or for German speakers please participate in the seminar of Boris Suchan on EEG instead it will be accepted as a course in the module "Advanced Methods" this time).

2. If you plan to use EEG-methods for your master thesis project, then you are supposed to participate in the following package of seminar and laboratory course, i.e. at least seminar 1 (offered by Fellner and Waldhauser) and laboratory course (offered by Fellner and Waldhauser).

3. You may specialize very intensely in EEG-methods, then you can combine three courses, one of the courses on EEG described under number 1 and the intense package described under number 2.

Seminar 1: "Angewandte neuropsychologische Methoden EEG" (118 153),
max. 20 participants
Dr. Marie Fellner, Dr. Gerd Waldhauser
Monday, 12:00 – 14:00, First Meeting: 24.04.2017, Room GAFO 05/609

The seminar course stands in direct relation to the laboratory course with the same name (also 2 SWS). Participation in both modules is mandatory.

The goal is to relay the ability to develop further research questions in cognitive neuroscience based on published neuropsychological literature, and to develop, independently conduct, and analyze studies corresponding to these research questions. An additional goal is to acquire the ability to present the
results in writing corresponding to the standards of neuroscientific journals. The course will be held in English.

**Laboratory Course:**  "Angewandte neuropsychologische Methoden EEG" (118 152),  
max. 20 participants  
Dr. Marie Fellner, Dr. Gerd Waldhauser  
Monday, 8:00 – 10:00, First Meeting: 24.04.2017, Room GAFO 04/615

The laboratory course stands in direct relation to the seminar course with the same name (also 2 SWS). Participation in both modules is mandatory.

The goal is to relay the ability to develop further research questions in cognitive neuroscience based on published neuropsychological literature, and to develop, independently conduct, and analyze studies corresponding to these research questions. An additional goal is to acquire the ability to present the results in writing corresponding to the standards of neuroscientific journals. The course will be held in English.

**Seminar 2:**  „Ereigniskorrelierte Potentiale in der Neuropsychologie“ (118 151) <IN GERMAN>  
Prof. Dr. Boris Suchan  
Monday, 10:00 – 12:00, First Meeting: 24.04.2017, Room GAFO 05/609

I. Free Selection

Please notice that under the category "free selection" we only describe courses which are in German as additional offers. For the German speakers please notice that you are only allowed to have maximally three courses in German in the whole program. For all students including the English speaking students the following rule holds: All courses of the whole program can also be accepted in the module free selection, i.e. if you have completed (or you have a clear plan how to complete) the obligatory modules, you can choose whatever course supports you best to realize the optimal master thesis. Furthermore, we can in principle accept also internships up to 10 credit points in the category of free selection. The internship must of course be equivalent to the number of credit points and it must be an internship that is proven to qualify for the program "Cognitive Science" and ideally supports the master thesis. If you aim to use an internship as a way to complete a part of this module then please contact Dr. Brössel or Prof. Newen in advance.

Free Selection

D1.

BLOCKSEMINAR
GROWING UP POOR: EARLY EXPERIENCES AND CHILDREN'S DEVELOPMENT IN THE EARLY YEARS (115 413)
PROF. NATASHA CABRERA

TERM: SUMMER 2017
MEETING TIME: 18.05.2017: 14:00 – 16:00; 24.06. & 01.07.2017: 9:00 – 18:00
ROOM: 18.05.: GAFO 02/365; 24.06. & 01.07.: GAFO 04/425
CP: T.B.A.

The aim of this course is to cover theory and research in the area of fatherhood and father involvement. The study of fatherhood and father involvement includes defining who is a father, understanding how fatherhood is conceptualized, exploring the meaning of father involvement, drawing implications for child development, understanding fatherhood in relationship to motherhood, looking at how the broad social context influences fatherhood and father involvement, examining how social policies can promote or hinder certain types of fathering, exploring how men see themselves as fathers, looking at how fatherhood changes men's developmental trajectories, and exploring how other disciplines (economics, sociology, anthropology) study fatherhood. We will also cover basic concepts in methodology, measurement design, and issues related to connecting research to policy.
The aim of this course is to cover theory and research in the area of fatherhood and father involvement. The study of fatherhood and father involvement includes defining who is a father, understanding how fatherhood is conceptualized, exploring the meaning of father involvement, drawing implications for child development, understanding fatherhood in relationship to motherhood, looking at how the broad social context influences fatherhood and father involvement, examining how social policies can promote or hinder certain types of fathering, exploring how men see themselves as fathers, looking at how fatherhood changes men’s developmental trajectories, and exploring how other disciplines (economics, sociology, anthropology) study fatherhood. We will also cover basic concepts in methodology, measurement design, and issues related to connecting research to policy.
**VORLESUNG**  
**KOGNITION UND GEHIRN (112 611)**  
PROF. OLIVER WOLF

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<td>CP:</td>
<td>t.b.a.</td>
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Literatur:
Onur Güntürkün, Biopsychologie, Hogrefe Verlag 2012, Kapitel 5 - 12
Bekanntgabe weiterer aktueller Literatur während der Veranstaltung und über Blackboard.

Anforderungen für einen kleinen Studiennachweis: Lektüre ausgewählter Texte und Bearbeitung von kleinen Aufgaben zur Vorbereitung der Sitzungen; aktive Mitarbeit; Klausur.

Die Gesamtnote konstituiert sich aus einer individuell und schriftlich zu erbringenden Leistung, deren Form von der/dem Lehrenden festgelegt wird. Darüber hinaus werden weitere, jedoch unbenotete Leistungen verlangt.
Only 2 people may join. If you are interested, please send an application directly to Robert Kumsta: Robert.Kumsta@rub.de.

NEUROEPIGENETIK (118 161)
DR. VANESSA LUX

TERM: Summer 2017
MEETING TIME: Thursday, 12.00 – 14.00, First Meeting: 20.04.2017
ROOM: GAFO 04/425
CP: t.b.a.


Prerequisites: knowledge of learning and memory at Bachelor level
Assessment: presentations, active participation
Course material: Blackboard (sign-up required)
Textbook:

Description:
When we remember events from our lives, whether they are the once-in-a-lifetime or everyday kind, we use our episodic memory. Although a small region of the brain called the hippocampus was identified to be important for episodic memories a long time ago, the nature and neural basis of episodic memory remain unclear. This class will employ a novel, highly interactive format to introduce the students to the cutting edge of the research into episodic memory. Students will be involved in choosing the literature discussed in class and discuss their views with an invited speaker who will also give a scientific talk.
Free Selection

BLOCKSEMINAR
ENTWICKLUNGSNEUROPSYCHOLOGIE (118 911)
PROF. DR. SARAH WEIGELT

TERM: Summer 2017
MEETING TIME: 27.04.: 10:00 – 12:00, 30.06.: 10:00 – 19:00, 01.07.: 9:00-18:00
ROOM: 27.04. & 01.07.: GAFO 02/373; 30.06.: GAFO 03/252
CP: t.b.a.

Teilnahme nur möglich nach vorheriger Anmeldung direkt bei Frau Prof. Dr. Weigelt:
sarah.weigelt@rub.de


Dieses Forum dient zur Vorstellung aktueller Forschungsprojekte und Qualifikationsarbeiten (Bachelorarbeiten, Masterarbeiten, Promotionsprojekte) der Arbeitseinheit Genetic Psychology. Darüber hinaus werden eingeladene Wissenschaftler aktuelle Forschungsergebnisse vorstellen.
SECOND YEAR PROGRAM

Please notice that one and the same course can only be accepted as part of one Module. Double use of the same Module is prohibited.

I. Interdisciplinary Research Module

Usually the interdisciplinary research modules should be completed in the third semester (winter semester). To keep flexibility for the students we offer some courses for these modules in the summer semester as well. Please check individually with the lecturer whether the colloquium will be in English. If the announcement is in English it is in English. But even if the announcement is in German the course may be in English because the literature discussed is in English.

Focus Module Philosophy

**RESEARCH COLLOQUIUM: PHILOSOPHY MEETS COGNITIVE SCIENCE (030130)**
PROF. MARKUS WERNING

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<td>MEETING TIME:</td>
<td>Thursday, 16:00 – 18:00, First Meeting: 20.04.2017</td>
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In the research colloquium current topics at the interface between Philosophy and Cognitive Science will be discussed. In this seminar we focus on the investigation of language and cognition. The colloquium hosts talks by visiting leading experts and local researchers as well as presentations by doctoral and master students. Students will be given the (assisted) opportunity to present their projects in English.
In this forum, scientific projects (i.e. Master and PhD projects) of the Cognitive Psychology work group will be presented. The main focus is on experimental stress studies. Here we will try to answer the questions, “what makes us stressed” and “how does stress affects our cognitive skills”. In addition, invited guests from our faculty, from other faculties of the RUB and from other universities world wide will present their current research findings on topics that relate to cognitive psychology or psychoneuroendocrinology.

An overview of the schedule will be available on the AE homepage from the beginning of April.

The seminar will be held in the English language.
In this journal club we will present and critically discuss current scientific papers on the topic of stress and cognitive processes.

The seminar will be held in the English language.
We will focus on the neural basis of learning and memory at the systems level. In each session a journal article will be presented by one participant and discussed by all participants. The articles will be selected particularly in the areas of spatial and episodic memory. They will focus on the functional role of the mammalian hippocampus in these processes and include a diverse set of approaches: electrophysiology, imaging, computational modeling, and robotics.
This lecture presents models of selforganization in neural systems, in particular addressing vision (receptive fields, neural maps, invariances, attention) and associative memory (Hopfield network).

If this seminar is used for Module C3, it cannot be used for I3.
Neuroinformatics is concerned with the discovery of new solutions to technical problems of information processing. These solutions are sought based on analogies with nervous systems and the behaviour of organisms. This course focuses on three exemplary problems to illustrate this approach:

(a) Artificial action (autonomous robotics);
(b) Artificial perception (robot vision);
(c) Artificial cognition (simplest cognitive capabilities of autonomous robots such as decision making, memory, behavioural organization).

The main methodological emphasis is on nonlinear dynamical systems’ approaches and dynamic (neural) fields.

If this seminar is used for Module C2, it cannot be used for I3.
The research colloquium is open to all employees and graduate students of the Biopsychology department. The aim is to present and discuss their research. In addition, external guests are invited to give talks on different aspects of biopsychology. You can have a look at the schedule at the department’s information board and our homepage: [http://www.bio.psy.ruhr-unibochum.de/](http://www.bio.psy.ruhr-unibochum.de/).