

# Course Guide – Master Cognitive Science

Summer 2017

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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](mailto: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.

## FIRST YEAR PROGRAM

# C1.

Social Cognition & Meta-Science

*SEMINAR*

**THE EXPERIMENTAL PHILOSOPHY OF MORALITY (030 097)**

KAROLINA PROCHORNIK & PASCALE WILLEMSSEN

<b>TERM:</b>	Summer 2017
<b>MEETING TIME:</b>	Thursday, 14:00 – 16:00, first Meeting: 27.04.2017
<b>ROOM:</b>	GABF 04/714
<b>CP:</b>	6

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.

C1.

## Social Cognition &amp; Meta-Science

*SEMINAR***THE EVOLUTION OF MORALITY (030 068)**

DR. TOBIAS STARZAK

<b>TERM:</b>	Summer 2017
<b>MEETING TIME:</b>	Tuesday, 14:00 – 16:00, first Meeting: 18.04.2017
<b>ROOM:</b>	GA 3/143.
<b>CP:</b>	6

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.

C2.

## Perception &amp; Action

*SEMINAR***SITUATED COGNITION. THE NATURE AND LOCATION OF COGNITION (030 080)**

PROF. ALBERT NEWEN

<b>TERM:</b>	Summer 2017
<b>MEETING TIME:</b>	Monday, 16:00 – 18:00, first Meeting: 24.04.2017
<b>ROOM:</b>	GABF 04/716
<b>CP:</b>	6

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.

C2.

## Perception &amp; Action

*LECTURE & EXERCISE***AUTONOMOUS ROBOTICS: ACTION, PERCEPTION, AND COGNITION  
(310 501 & 310 511)**

PROF. GREGOR SCHÖNER

<b>TERM:</b>	Summer 2017
<b>LECTURE:</b>	THURSDAY, 14.15 – 16.00 (FIRST MEETING: 20.04.2017)
<b>EXERCISE:</b>	THURSDAY, 16.15 – 17.00 (FIRST MEETING: 27.04.2017)
<b>ROOM:</b>	NB 3/57
<b>CP:</b>	6

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.

C3.

## Memory, Learning &amp; Decision Making

SEMINAR

PHILOSOPHY OF MEMORY (030 086)

PROF. DR. MARKUS WERNING

<b>TERM:</b>	Summer 2017
<b>MEETING TIME:</b>	Wednesday, 12:00 – 14.00, first Meeting: 19.04.2017
<b>ROOM:</b>	GA 04/187
<b>CP:</b>	6

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 seem 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:

Cheng, S., & Werning, M. (2016). What is Episodic Memory if it is a Natural Kind? *Synthese*, 193, 1345–1385.

Bernecker, S. & Michaelian, K. (Eds., 2017). *Routledge Handbook of Philosophy of Memory*. London: Routledge.

Bernecker, S. (2010). *Memory : a philosophical study*. Oxford University Press.

Eichenbaum, H. (2011). *The cognitive neuroscience of memory: an introduction*. Oxford: Oxford University Press.

Hasselmo, M. E. (2012). *How We Remember: Brain Mechanisms of Episodic Memory*. Cambridge, MA: MIT Press.

Michaelian, K. (2016). *Mental time travel: episodic memory and our knowledge of the personal past*. Cambridge, MA: MIT Press.

C3.

## Memory, Learning &amp; Decision Making

*LECTURE & EXERCISE***COMPUTATIONAL NEUROSCIENCE: VISION AND MEMORY****(310 504 & 310 514)**

PROF. LAURENZ WISKOTT

<b>TERM:</b>	Summer 2017
<b>LECTURE:</b>	Tuesday, 12.15 – 13.45, First Meeting: 18.04.2016
<b>EXERCISE:</b>	Tuesday, 9:00 – 12:00, First Meeting: 25.04.2016
<b>ROOM:</b>	NB 3/57 (both, lecture & exercise)
<b>CP:</b>	6

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).

C3.

## Memory, Learning &amp; Decision Making

*SEMINAR***DISCOURSE IN EPISODIC MEMORY (310 524)**

PROF. SEN CHENG

<b>TERM:</b>	Summer 2017
<b>MEETING TIME:</b>	Monday, 14:00 – 16:00, First Meeting: 24.04.2017
<b>ROOM:</b>	NB 3/72
<b>CP:</b>	3

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.



C3.

## Memory, Learning &amp; Decision Making

*SEMINAR***DISCOURSE GRID CELLS (118 165)**

PROF. NIKOLAI AXMACHER

<b>TERM:</b>	Summer 2017
<b>MEETING TIME:</b>	Tuesday, 10:00 – 12:00, First Meeting: 18.04.2017
<b>ROOM:</b>	GAFO 05/609
<b>CP:</b>	t.b.a.

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.

C3.

## Memory, Learning &amp; Decision Making

*SEMINAR***DISCOURSE ENGRAMM (118 163)**

PROF. NIKOLAI AXMACHER

<b>TERM:</b>	Summer 2017
<b>MEETING TIME:</b>	Thursday, 10:00 – 12:00, First Meeting: 20.04.2017
<b>ROOM:</b>	GAFO 05/609
<b>CP:</b>	t.b.a.

Die Repräsentation spezifischer Inhalte im Gedächtnis wird als "Engramm" bezeichnet. Während es lange nicht möglich war, Engramme direkt zu messen, gelang vor einigen Jahren mit modernsten experimentellen Methoden ein Durchbruch bei der Forschung in Nagetieren. Können Engramme auch bei Menschen mittels fMRT oder EEG gemessen werden, z.B. mittels multivariater "pattern classification" Methoden? Diese aktuelle Forschungsfrage soll anhand ausgewählter Artikel diskutiert werden.

C3.

## Memory, Learning &amp; Decision Making

*LECTURE & SEMINAR***COGNITIVE NEUROSCIENCE OF MEMORY (118 128)**

PROF. NIKOLAI AXMACHER

<b>TERM:</b>	Summer 2017
<b>MEETING TIME:</b>	Wednesday, 10:00 – 12:00, First Meeting: 19.04.2017
<b>ROOM:</b>	GAFO 05/609
<b>CP:</b>	t.b.a.

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.

C4.

Language, Logic &amp; Categories

*BLOCKSEMINAR***NEGATION AND NEGATIVITY IN NATURAL LANGUAGE (030 088)**

PROF. MARKUS WERNING

<b>TERM:</b>	Summer 2017
<b>MEETING TIME:</b>	25.-29.04.2017, 10:00-17:00
<b>ROOM:</b>	GA 04/187
<b>CP:</b>	2 - 6

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-uni-bochum.de/phil-lang/Negation.html>.

References:

Larrivé, Pierre, Lee, Chungmin (Eds.) (2016): *Negation and Polarity: Experimental Perspectives*. Springer International Publishing.

Horn, Laurence R. and Wansing, Heinrich, "Negation". In Edward N. Zalta (ed.), *The Stanford Encyclopedia of Philosophy* (Spring 2017 Edition), <http://plato.stanford.edu/archives/win2016/entries/negation>.

C4.

Language, Logic &amp; Categories

*KOLLOQUIUM***PHILOSOPHY MEETS COGNITIVE SCIENCE (030 130)**

PROF. MARKUS WERNING

<b>TERM:</b>	Summer 2017
<b>MEETING TIME:</b>	Thursday, 16:00 – 18:00, First Meeting: 20.04.2017
<b>ROOM:</b>	GA 04/187
<b>CP:</b>	6

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](mailto: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](http://www.ruhr-uni-bochum.de/philosophy/mcs/program_courses.html). They will again be offered in the upcoming summer semester.

AM1.

Theory Formation and Conceptual Analysis

*SEMINAR***THE EXPERIMENTAL PHILOSOPHY OF MORALITY (030 097)**

KAROLINA PROCHOWNIK &amp; PASCALE WILLEMSSEN

<b>TERM:</b>	Summer 2017
<b>MEETING TIME:</b>	Thursday, 14:00 – 16:00, First Meeting: 27.04.2017
<b>ROOM:</b>	GABF 04/714
<b>CP:</b>	6

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.

AM1.

Theory Formation and Conceptual Analysis

*SEMINAR***SITUATED COGNITION. THE NATURE AND LOCATION OF COGNITION (030 080)**

PROF. ALBERT NEWEN

<b>TERM:</b>	Summer 2017
<b>MEETING TIME:</b>	Monday, 16:00 – 18:00, First Meeting: 24.04.2017
<b>ROOM:</b>	GABF 04/716
<b>CP:</b>	6

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.



AM2.

Advanced Analysis of Language and Logic

*LECTURE***EPISTEMIC LOGIC (030 085)**

DR. PERE PARDO VENTURA

<b>TERM:</b>	Summer 2017
<b>MEETING TIME:</b>	Wednesday, 14.00 – 16.00, First Meeting: 19.04.2017
<b>ROOM:</b>	GABF 04/358
<b>CP:</b>	6

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.

AM3

Behaviour Studies

*BLOCKSEMINAR***NEUROMODULATION OF COGNITION (118 146)**

DR. LORENZA COLZATO

<b>TERM:</b>	SUMMER 2017
<b>MEETING TIME:</b>	16.06.2017, 14:00 – 18:00; 17-18.06.2017, 09:00 – 18:00
<b>ROOM:</b>	16.06.: GAFO 02/364; 17.-18.06.: GAFO 03/252
<b>CP:</b>	T.B.A.

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.

**AM4.**

Computational Modeling

*LECTURE & EXERCISE***MATHEMATICS FOR MODELING AND DATA ANALYSIS****(310 503 & 310 513)**

PROF. LAURENZ WISKOTT

<b>TERM:</b>	Summer 2017
<b>LECTURE:</b>	Thursday, 12.15 – 13.45, First Meeting: 20.04.2017
<b>EXERCISE:</b>	Thursday, 9:00 – 12:00, First Meeting: 27.04.2017
<b>ROOM:</b>	NB 3/57
<b>CP:</b>	6

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.

**AM5.**

Special Methods in Neuroscience/Genetics

*LECTURE & SEMINAR***COGNITIVE NEUROSCIENCE OF MEMORY (118 128)***PROF. NIKOLAI AXMACHER*

<b>TERM:</b>	Summer 2017
<b>MEETING TIME:</b>	Wednesday, 10:00 – 12:00, First Meeting: 19.04.2017
<b>ROOM:</b>	GAFO 05/609
<b>CP:</b>	t.b.a.

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.

**AM5.**

Special Methods in Neuroscience/Genetics

*SEMINAR***EXTRACELLULAR NEURAL RECORDINGS**

DR. JONAS ROSE &amp; DR. ROLAND PUSCH

<b>TERM:</b>	Summer 2017
<b>MEETING TIME:</b>	t.b.a.
<b>ROOM:</b>	t.b.a.
<b>CP:</b>	t.b.a.

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.

**AM5.**

Special Methods in Neuroscience/Genetics

*SEMINAR***PROGRAMMIEREN IN MATLAB / PROGRAMMING IN MATLAB  
(118155)**

DR. JONAS ROSE &amp; DR. ROLAND PUSCH

<b>TERM:</b>	Summer 2017
<b>MEETING TIME:</b>	Thursday, 16:00-18:00, First Meeting: 20.04.2017
<b>ROOM:</b>	GAFO 04/615 (Medienraum)
<b>CP:</b>	t.b.a.

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](mailto:roland.pusch@rub.de)/[christoph.fraenz@rub.de](mailto:christoph.fraenz@rub.de)

Raum: Medienraum GAFO 04/615 Do, 16.00 - 18.00, plus Blockveranstaltung (am Wochenende).

AM6.

EEG-training

*SEMINAR & PRACTICAL COURSE*

ANGEWANDTE NEUROPSYCHOLOGISCHE METHODEN /  
 ADVANCED EEG-ANALYSIS (118 152, 118 153, 118 130, 118 151)  
 PROF. NIKOLAI AXMACHER

TERM:	Summer 2017
SEMINAR 1:	Monday, 12:00 – 14:00, First Meeting: 24.04.2017
LAB COURSE:	Monday, 8.00 – 10.00 First Meeting: 24.04.2017
SEMINAR 2:	Monday, 10:00 – 12:00 <IN GERMAN>, First Meeting: 24.04.2017
CP:	9

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**

Das Seminar beschäftigt sich mit der Technik des Elektroenzephalogramms und den ereigniskorrelierten Potentialen. Diese Methode ist in der Neuropsychologie sowohl in Forschung als auch in der klinischen Anwendung sehr wichtig. Im Seminar werden alle wichtigen Paradigmen vorgestellt und diskutiert. Ebenfalls werden praktische Übungen im Labor durchgeführt. Eine Literaturliste wird zu Beginn des Seminars verteilt.



## 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.

# D1.

### Free Selection

#### *BLOCKSEMINAR*

#### **GROWING UP POOR: EARLY EXPERIENCES AND CHILDREN'S DEVELOPMENT IN THE EARLY YEARS (115 413)**

PROF. NATASHA CABRERA

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

D1.

Free Selection

*BLOCKSEMINAR***FATHERS' (AND MOTHERS') INFLUENCE ON CHILDREN'S DEVELOPMENT: EVIDENCE FROM EARLY TO MIDDLE CHILDHOOD (115412)**

PROF. NATASHA CABRERA

<b>TERM:</b>	Summer 2017
<b>MEETING TIME:</b>	20.04.2017: 14:00 – 16:00; 06. & 13.05.2017: 9:00 – 18:00
<b>ROOM:</b>	20.04.: GAFO 02/365; 06. & 13.05.: GAFO 04/425
<b>CP:</b>	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.

D1.

Free Selection

*VORLESUNG***KOGNITION UND GEHIRN (112 611)**

PROF. OLIVER WOLF

<b>TERM:</b>	Summer 2017
<b>MEETING TIME:</b>	Monday, 14.00 – 16.00, First Meeting: 24.04.
<b>ROOM:</b>	HGA 30
<b>CP:</b>	t.b.a.

Die Vorlesung ist für Studierende ab dem 4. Semester geeignet. Sie bietet einen Überblick über Befunde und Theorien zu aktuellen Themen der kognitiven Neurowissenschaft. Die Vorlesung setzt Grundkenntnisse der Kognitionspsychologie und der Biopsychologie voraus, die bis zum 4. Semester vermittelt werden. Kenntnisse aus dieser Vorlesung werden im Master Studiengang Psychologie und Kognitive Neurowissenschaft vorausgesetzt.

D1.

Free Selection

*SEMINAR***JOURNAL CLUB (118 915)**

PROF. NIKOLAI AXMACHER

**TERM:** Summer 2017  
**MEETING TIME:** Thursday, 16:00 – 18:00, First Meeting: 20.04.2017  
**ROOM:** GAFO 05/609  
**CP:** t.b.a.

In Analogie zu den Kognitiven Neurowissenschaften - der Untersuchung der neuronalen Korrelate kognitiver Prozesse - wurden in den letzten Jahren auch Konzepte der Psychoanalyse mit bildgebenden Methoden untersucht. Dieses Seminar vermittelt einen Überblick über diese Studien. Dabei werden aktuelle Untersuchungen zu zentralen psychoanalytischen Konzepten (Verdrängung, Konversion, Träume, Traumatisierung...), aber auch Studien zu den Mechanismen der psychodynamischen Psychotherapie sowie psychodynamische Konzeptualisierungen neuropsychologischer Symptome vorgestellt und diskutiert.

D1.

Free Selection

*LECTURE***EVOLUTION UND EMOTION (112 251)**

PROF. ONUR GÜNTÜRKÜN

<b>TERM:</b>	Summer 2017
<b>MEETING TIME:</b>	Thursday, 16.00 – 18.00, First Meeting: 20.04.2017
<b>ROOM:</b>	HGA 10
<b>CP:</b>	3

Wie verlief bisher die Geschichte des Lebens? Innerhalb welchen Gesamtszenarios bettet sich die Entstehung des Menschen ein und welche Anteile unseres heutigen Denkens, Handelns und Fühlens reflektieren die Gesetzmäßigkeiten, die bei der Phylogenese unseres Gehirns wirksam waren? Wie determiniert die Interaktion von Umweltfaktoren und genetischer Anlage unsere Entwicklung? Um solche Fragen beantworten zu können, müssen wir die Evolutionstheorie mit allen ihren Implikationen kennenlernen. In der Vorlesung sollen folgende Themen behandelt werden: 1) Mechanismen der Genetik und Epigenetik 2) Verhaltensgenetik. 3) Entwicklung des Lebens und des Menschen. 4) Emotionsmechanismen. 5) Soziobiologie.

D1.

Free Selection

*LECTURE***BIOPSYCHOLOGIE (112 631)**

PROF. ONUR GÜNTÜRKÜN

<b>TERM:</b>	Summer 2017
<b>MEETING TIME:</b>	Thursday, 12.00 – 14.00, First Meeting: 20.04.2017
<b>ROOM:</b>	GAFO 03/252
<b>CP:</b>	3

Das Wissen um Hirnaufbau und Hirnfunktion ist die Grundlage für das Verstehen sämtlicher bio- und neuropsychologischer Fragestellungen. In dieser Vorlesung wollen wir uns exemplarisch das Sehsystem des Menschen vornehmen. Wir wollen seine Funktionen verstehen, indem wir die Anatomie und Physiologie des Sehsystems kennenlernen und neuropsychologische Ausfälle anschauen. Danach wollen wir kennenlernen, wie die visuelle Information in die Prozesse des präfrontalen Cortex integriert wird, so dass die Fähigkeit zum Behalten, Planen und Handeln entsteht. Kurz gesagt, wollen wir die neuronalen Grundlagen des Wahrnehmens und Erkennens kennenlernen.

Literatur:

Onur Güntürkün, Biopsychologie, Hogrefe Verlag 2012, Kapitel 5 - 12

Bekanntgabe weiterer aktueller Literatur während der Veranstaltung und über Blackboard.

D1.

Free Selection

*SEMINAR***LERNEN UND PROBLEMLÖSEN (030 268)**

PROF. NIKOL RUMMEL

<b>TERM:</b>	Summer 2017
<b>MEETING TIME:</b>	Tuesday, 10.00 – 12.00, First Meeting: 25.04.2017
<b>ROOM:</b>	GABF 04/358
<b>CP:</b>	4

Die Fähigkeit Probleme zu lösen wird als eine der Schlüsselkompetenzen für die Bewältigung von Anforderungen im beruflichen wie privaten Alltag angesehen. Entsprechend stellt sich die Frage, wie eine solche Problemlösefähigkeit zu vermitteln ist. Gleichzeitig wird Problemlösen als Instruktionsmethode genutzt. Dadurch stellt sich die Frage nach dem Zusammenspiel von Problemlösen und Lernen. In dem Seminar wird zunächst auf theoretischer Basis die Fähigkeit zum Lernen definiert; anschließend werden verschiedene Formen des Lernens kontrastiert. Der zweite Teil der Veranstaltung beschäftigt sich mit dem Konzept des Problemlösens. Schließlich werden Lernen und Problemlösen einander gegenübergestellt. Abschließend werden spezifische Situationen, in denen Lernen und Problemlösen stattfinden betrachtet und die damit einhergehenden Möglichkeiten bzw. Herausforderungen diskutiert.

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.

D1.

Free Selection

*SEMINAR***PSYCHIATRISCHE GENETIK UND EPIGENETIK (118 162)**

PROF. ROBERT KUMSTA

<b>TERM:</b>	Summer 2017
<b>MEETING TIME:</b>	Wednesday, 14.00 – 16.00, First Meeting: 19.04.2017
<b>ROOM:</b>	GAFO 04/271
<b>CP:</b>	t.b.a.

Only 2 people may join. If you are interested, please send an application directly to Robert Kumsta:  
*Robert.Kumsta@rub.de*.

In diesem Seminar wird über aktuelle Forschungsergebnisse aus der molekularen Verhaltensgenetik diskutiert. Im Fokus stehen dabei Befunde der psychiatrischen Genetik, sowie Ergebnisse zu Gen-

Umwelt-Interaktionen, Genexpression und der Epigenetik. Beispielsweise wird die Frage nach den Mechanismen behandelt, wie sich frühe Umweltfaktoren „biologisch festschreiben“ (biological embedding of experience), und welche Rolle dabei epigenetische Prozesse spielen. Außerdem wird der Nutzen von Biomarkern besprochen. Die genaue Auswahl der Literatur findet in Absprache mit den

Teilnehmern statt. Aktuelle Publikationen werden besprochen und methodenkritisch analysiert.



D1.

Free Selection

*SEMINAR***NEUROEPIGENETIK (118 161)**

DR. VANESSA LUX

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

Neuroepigenetik untersucht epigenetische Mechanismen, die die Genexpression in neuronalen Zellen beeinflussen. Erste Forschungsergebnisse zeigen, dass diese sowohl an der Zelldifferenzierung und Gehirnentwicklung als auch an Lernen und Gedächtnis beteiligt sind. Im Seminar werden die zentralen Mechanismen (DNA-Methylierung, Histonmodifikationen und RNA-Interferenz) und Modelle der Gen-Umwelt-Interaktion anhand verschiedener Forschungsbereiche (Entwicklungsneurobiologie, Gedächtnisforschung, Lernen, Stressforschung) und ersten Befunden exemplarisch veranschaulicht. Die Teilnehmer erhalten einen vertiefenden Einblick in dieses aktuelle Forschungsfeld und lernen, Forschungsliteratur effizient zu lesen und kritisch zu beurteilen. Auch werden Möglichkeiten und Grenzen der Forschungsrichtung und ihrer Methoden (molekularbiologische Analysen, Tiermodelle, periphere Marker) für die Anwendung auf psychologische Fragestellungen diskutiert.

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.

D1.

Free Selection

*BLOCKSEMINAR***ENTWICKLUNGSNEUROPSYCHOLOGIE (118 911)**

PROF. DR. SARAH WEIGELT

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

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

Die Entwicklungsneuropsychologie im Schnittbereich von Entwicklungspsychologie und Kognitiven Neurowissenschaften stellt ein relativ junges Forschungsfeld dar, das sich mit der menschlichen Gehirnentwicklung über die Lebensspanne befasst. Die Anwendung von Methoden der Kognitiven Neurowissenschaften wie etwa den hirnbildgebenden Verfahren bei Kindern und Jugendlichen eröffnet einen faszinierenden Blick in die gesunde und atypische Entwicklung von Gehirn und Verhalten. Im Seminar erarbeiten wir Prinzipien der menschlichen Hirnentwicklung und gewinnen Eindrücke in entwicklungsneuropsychologische Störungsbilder.

Vorbesprechung am Mittwoch, den 26.4. von 10-12 Uhr, das Seminar Freitag, den 30.6. und Samstag, den 1.7. von 9-18 Uhr.

D1.

Free Selection

*COLLOQUIUM***RESEARCH COLLOQUIUM: GENETIC PSYCHOLOGY (118 911)**

DR. ROBERT KUMSTA

<b>TERM:</b>	Summer 2017
<b>MEETING TIME:</b>	Monday, 16.00 – 18.00, First Meeting: 24.04.2017
<b>ROOM:</b>	GAFO 04/425
<b>CP:</b>	t.b.a.

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.

# 11.

#### Focus Module Philosophy

##### *COLLOQUIUM*

**RESEARCH COLLOQUIUM: PHILOSOPHY MEETS COGNITIVE SCIENCE (030130)**

PROF. MARKUS WERNING

<b>TERM:</b>	Summer 2017
<b>MEETING TIME:</b>	Thursday, 16:00 – 18:00, First Meeting: 20.04.2017
<b>ROOM:</b>	GA 04/187
<b>CP:</b>	6

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.

12.

## Focus Module Psychology

*SEMINAR*SCIENTIFIC COLLOQUIUM: COGNITIVE PSYCHOLOGY AND  
PSYCHONEUROENDOCRINOLOGY (118 913)

PROF. OLIVER T. WOLF

TERM:	Summer 2017
MEETING TIME:	Tuesday, 16.00 – 18.00, First Meeting: 18.04.2017
ROOM:	GAFO 02/373
CP:	t.b.a.

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 wild 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.

12.

## Focus Module Psychology

*SEMINAR***JOURNAL CLUB: STRESS AND LEARNING (118 917)**

PROF. OLIVER T. WOLF

<b>TERM:</b>	Summer 2017
<b>MEETING TIME:</b>	Wednesday, 12:00 – 14:00, First Meeting: 19.04.
<b>ROOM:</b>	GAFO 05/609
<b>CP:</b>	t.b.a.

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.

12.

## Focus Module Psychology

*SEMINAR*

JOURNAL CLUB: LEARNING AND MEMORY (310 526)

PROF. SEN CHENG

TERM:	Summer 2017
MEETING TIME:	Tuesday, 12:00 – 14:00, first meeting: 18.04.2017
ROOM:	NB 3/72
CP:	3

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.

## 13.

## Focus Module Computational Modeling

*LECTURE & EXERCISE***COMPUTATIONAL NEUROSCIENCE: VISION AND MEMORY  
(310 504 & 310 514)**

PROF. LAURENZ WISKOTT

<b>TERM:</b>	Summer 2017
<b>LECTURE:</b>	Tuesday, 12:15 – 13:45, First Meeting: 18.04.2016
<b>Exercise:</b>	Tuesday, 9:00 – 12:00, First Meeting: 25.04.2016
<b>ROOM:</b>	NB 3/57
<b>CP:</b>	6

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.



## 13.

## Focus Module Computational Modeling

*LECTURE & EXERCISE***AUTONOMOUS ROBOTICS: ACTION, PERCEPTION, AND COGNITION (310 501 & 310 511)***PROF. GREGOR SCHÖNER*

<b>TERM:</b>	Summer 2017
<b>LECTURE:</b>	Thursday, 14.15 – 16.00 (first meeting: 20.04.2017)
<b>EXERCISE:</b>	Thursday, 16.15 – 17.00 (first meeting: 27.04.2017)
<b>ROOM:</b>	NB 3/57
<b>CP:</b>	6

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.

14.

## Focus Module Neuroscience

*COLLOQUIUM*

RESEARCH COLLOQUIUM NEUROPSYCHOLOGY (118 912)

PROF. NIKOLAI AXMACHER

<b>TERM:</b>	Summer 2017
<b>MEETING TIME:</b>	Thursday, 14:00 – 16:00, First Meeting: 20.04.2017
<b>ROOM:</b>	GAFO 05/609
<b>CP:</b>	t.b.a.

Vorstellung laufender Forschungsarbeiten, sowie Vorträge von Gastdozenten zu klinisch-neuropsychologischen Themen. Ein Zeitplan mit Informationen über Themen und Referenten wird zu Beginn des Semesters per Aushang und auf der Homepage bekannt gegeben. Die kritische Auseinandersetzung mit den Lerninhalten in Form von Diskussionen ist ein zentrales Lernziel und geht in die Bewertung mit ein.

14.

## Focus Module Neuroscience

*COLLOQUIUM*

RESEARCH COLLOQUIUM BIOPSYCHOLOGY (118 914)

PROF. ONUR GÜNTÜRKÜN

<b>TERM:</b>	Summer 2017
<b>MEETING TIME:</b>	Monday, 13.00 – 15.00, First Meeting: 24.04.2017
<b>ROOM:</b>	GAFO 05/425
<b>CP:</b>	t.b.a.

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/>