Master program "Mind and Brain"

Berlin School of Mind and Brain

Humboldt-Universität zu Berlin

Summer Semester 2018

ALL TIMES ARE MEANT S.T. (SHARP)!

Monday	Tuesday	Wednesday	Thursday	Friday
	9:00 – 10:30 Dziobek Empirical Research Training (Brain Track)		9:00 – 10:30 Tutorial I & II: Neuroimaging	9:00 – 10:30 Dziobek Empirical Research Training (Mind Track)
10:00 – 11:30 Haynes Neuroimaging	10:45 – 12:15 Empirical Research Training (Brain Track)	10:00 – 11:30 Finke Manipulation of Memory (B)	11:00 – 12:30 Tutorial I & II: Neuroimaging	10:45 – 12:15 Empirical Research Training (Mind Track)
12:15 – 13:45 Knoeferle / Pulvermüller Language and the Brain	13:15 – 14:45 Moore Nature, Nurture, Gender (M)	12:30 – 14:00 Tudge Applied Statistics (B)	13:00 – 14:30 Dziobek Research Colloquium (B)	13:15 – 14:45 Tutorial: Palleschi Language and the Brain
14:15 – 15:45 - Haynes/Pauen Neurosc. and Philosophy of Consciousness and Free Will (M/B) - Knoeferle Visual Context Effects in language Processing (B)	15:15 – 16:45 Coelho Mollo Cognitive Ontology (M)	14:30 – 16:00 Coelho Mollo Concepts and Mental Representation (M)	13:30 – 15:00 Tudge Python (B)	15:15 – 16:45 Tutorial: Sofroni Ethics and Neuroscience
		16:30 – 18:00 Loaiza / Kobylińska Psychology of Emotion (M/B)	15:30 – 17:00 Kaltwasser Interpersonal Perception (B)	
	18:15 – 19:45 Pauen Philosophical Colloquium (M)		17:30 – 19:00 Tramacere Neurobiological Bases of Consciousnes (B)	

Block Course: Moore, Metarepresentation and Metacognition (25-27 July 2018) – s. p. 12

Comprehensive Course Calendar

Mandatory Lectures

Monday 10:00 – 11:30 *start: 16 April 2018*

Neuroimaging

Prof. Dr. John-Dylan Haynes (Bernstein Center for Computational Neuroscience Berlin)

venue: Bernstein Center for Computational Neuroscience, Philippstraße 12 (House 6), 10115 Berlin, Lecture Hall

Mind and Brain students **only**!

The course provides an introduction to a number of key non-invasive research methods in structural and functional neuroimaging. Participating students will learn about the basics of functional MRI, EEG, and TMS including technological and physiological foundations, experimental design and basic and advanced statistical methods. The goal is to provide an understanding of functional neuroimaging that will allow students to design, perform and analyse their own studies.

Monday 12:15 – 13:45 *start: 16 April 2018*

Language and the Brain

Prof. Dr. Pia Knoeferle (Institut für deutsche Sprache und Linguistik, HU Berlin) / Prof. Dr. Dr. Friedemann Pulvermüller (Institut für Deutsche und Niederländische Philologie, FU Berlin)

venue: Bernstein Center for Computational Neuroscience, Philippstraße 12, Haus 6, 10115 Berlin, Lecture Hall

Language has been investigated from a range of perspectives. Linguists have described it as a formal system focusing on levels that range from phonology to syntax, semantics and pragmatics. Both linguists and psychologists worked on models focusing on the time course of linguistic processing in production and understanding, so that these psycholinguistic models could be tested in behavioral experiments. Most recently, neuro- and cognitive scientists attempt at spelling out the brain mechanisms of language in terms of neuronal structure and function. These efforts are founded in neuroscience data about the brain loci that activate when specific linguistic operations occur, the time course of their activation and the effects of their specific lesion. The lecture series will provide a broad introduction into these linguistic, psycholinguistic and neurolinguistics research streams and highlight a range of cutting edge behavioral and neuroscience findings addressing a broad range of linguistic issues, including, for example, the recognition of words, the parsing of sentences, and the computation of the meaning and communicative function of utterances. Language development and language disorders caused by disease of the brain will also be in the focus. The experimental approaches under discussion will range from behavioral (reaction time studies, eye tracking) to

neuroimaging methods (EEG, MEG, fMRI, NIRS) and neuropsychological ones (patient studies, TMS, tDCS). A discussion of major theoretical approaches to language in the human mind and brain will round up the lectures.

This lecture series is open to students at the Berlin School of Mind and Brain as well as for students of linguistics at both HU and FU Berlin.

Preparatory readings:

Pulvermüller, F. & Fadiga, L. 2016. Brain Language Mechanisms Built on Action and Perception. In G. Hickok & S. Small (Eds.), *Handbook of Neurobiology of Language*, Elsevier, Amsterdam, pp 311-324. doi: 10.1016/B978-0-12-407794-2.00026-2

Knoeferle, P. & Guerra, E. 2016. Visually situated language comprehension. *Language and Linguistics Compass*, 10, 66-82.

Tuesday 9:00 – 12:15 (Brain Track) *start: 17 April 2018*

Friday 9:00 – 12:15 (Mind Track) *start: 20 April 2018*

Empirical Research Training

Prof. Dr. Isabel Dziobek (Institut für Psychologie, HU Berlin & Berlin School of Mind and Brain)

venue: Invalidenstraße 110, 10115 Berlin, room 449

*Mind and Brain students **only**!*

In the empirical-experimental exercise students extend their basic knowledge of neurocognitive research methods gained in the research methods lecture and tutorial series and deepen their knowledge of theoretical principles and practical applications of neurocognitive methods. The objective of the class is to familiarize students with experimental (as well as descriptive) research methods by providing "hands-on" experiences in designing, conducting, analyzing, interpreting, and writing up one experimental neurocognitive research study. The empirical-experimental exercise is concluded with a documented individual report on the empirical project following APA guidelines.

As a result of careful study and fulfillment of the course assignments, students should be able to:

1. Develop experimental research problems in cognitive neuroscience
2. Conduct reviews of the scientific literature relevant to a chosen research problem
3. Formulate research hypotheses
4. Design experimental neurocognitive studies
6. Execute experimental studies by collecting research data under carefully controlled conditions
7. Summarize and statistically analyze research data
8. Evaluate research results and draw conclusions pertaining to hypotheses
9. Communicate research studies in oral, written, and poster formats

Mandatory Tutorials

Thursday 9:00 – 12:30 *start: 19 April 2018*

Please note that there will be two alternating groups (group I & group II).

Tutorial: Neuroimaging

Dr. Mareike Bayer (Berlin School of Mind and Brain), Dr. Thomas Christophel (Bernstein Center for Computational Neuroscience), Prof. Dr. Carsten Finke (Berlin School of Mind and Brain)

venue: Computer Pool BCCN, Institut für Biologie, Philippstr. 13, Haus 2, 10115 Berlin

*Mind and Brain students **only**!*

Friday 13:15 – 14:45 *start: 20 April 2018*

Tutorial: Language and the Brain

Daniela Palleschi (Einstein Center for Neuroscience Berlin)

venue: Invalidenstraße 110, 10115 Berlin, room 449

The tutorial will complement the lecture "Language and the Brain" by familiarizing students with current research questions regarding language and the brain, as well as the current methods and paradigms used to address these questions. The class will focus on group discussions of articles which investigate the underlying neuronal mechanisms of language, how humans use words to communicate ideas, how language may influence our perception, and current theories of embodied cognition.

Friday 15:15 – 16:45 *start: 20 April 2018*

Tutorial: Ethics and Neuroscience

Razvan Sofroni (Department of Philosophy, HU Berlin)

venue: Invalidenstraße 110, 10115 Berlin, room 449

The course will be concerned with issues at the intersection of neuroscience and philosophical ethics, comprising what has come to be known as *Neuroethics*. The course will be divided into two main sections. In the first half, we will deal with matters concerning what can be called the *ethics of neuroscience*: we will discuss a number of ethical questions that arise within and as a consequence of advances in neuroscience, like whether it is morally permissible to improve people's physical, cognitive and moral abilities through neuroenhancement. Going beyond questions of applied ethics, we will, secondly, take a closer look at what may be called the *neuroscience of ethics*, exploring potential implications of neuroscientific findings for a number of issues within moral philosophy. Among other things, we will discuss the relevance of neuroscientific discoveries for debates about free will and moral responsibility, both in general as well as in particular cases such as that of severe addiction. We shall also discuss which, if any, conclusions can be drawn from functional neuroimaging studies about the nature of moral thought. Finally, the course will offer plenty of opportunities to exercise and improve a number of key methodological competences required for serious research in the area of philosophical ethics.

Introductory Literature:

Farah, Martha J. (2002), Emerging Ethical Issues in Neuroscience, *Nature Neuroscience*, 5: 1123-1129.
Roskies, A.L. (2002), Neuroethics for the New Millenium, *Neuron*, 35:21-23.
Levy, N. (2012), Neuroethics. *WIREs Cogn Sci*, 3: 143–151.

Elective Courses:

Focus MIND

Monday 14:15 – 15:45 *start: 16 April 2018*

Current Issues in Neuroscience and Philosophy of Consciousness and Free Will

Prof. Dr. John-Dylan Haynes (Bernstein Center for Computational Neuroscience Berlin)

Prof. Dr. Michael Pauen (Department of Philosophy, HU Berlin)

venue: Rhoda-Erdmann-Haus, Philippstraße 13, House 22, 10115 Berlin, room 1023 (ground floor)

MIND/BRAIN

The seminar will focus on recent developments in neuroscience and philosophy with a specific focus on consciousness and free will.

Tuesday 13:15 – 14:45 *start: 8 May 2017 (!)*

Explaining Human Behaviour: Nature, Nurture, and Gender

Dr. Richard Moore (Berlin School of Mind and Brain)

venue: Invalidenstraße 110, 10115 Berlin, room 449

MIND

What explains human behaviour, and the apparent differences in behaviour between different populations of humans? Is it our genetic inheritance ('nature'), or the environment in which we are raised ('nurture')?

A historically popular idea in cognitive science research is that males and females have undergone selection pressure to fulfil different social roles. Men are hardwired to be hunters, and to protect the tribe; women to be mothers, and to care for the tribe. In recent years, this idea – and the cognitive science supporting it – has been challenged. We will read and discuss both recent cognitive science research and philosophical writing on gender and human nature, in order to better understand the biological and social foundations of human social identity. Readings will consist of a selection of works from evolutionary psychology – in particular studies of sexual behaviour and sexual difference in non-human great apes – and recent work in the Philosophy of Biology, and the Philosophy of Gender (including Cordelia Fine's Testosterone Rex, 2017 winner of the Royal Society science book of the year).

Key texts:

Fine, C. (2017). Testosterone Rex: Myths of Sex, Science, and Society. WW Norton & Company.

Sally, H. (2012). Resisting Reality: Social Construction and Social Critique. OUP.

Keller, E. F. (2010). The Mirage of a Space between Nature and Nurture. Duke University Press.

Wrangham, R. & Peterson, D. (1996). Demonic Males: Apes and the Origins of Human Violence. Houghton Mifflin Harcourt.

Tuesday 15:15 – 16:45 *start: 17 April 2018*

Cognitive Ontology

Dr. Dimitri Coelho Mollo (Berlin School of Mind and Brain)

venue: Invalidenstraße 110, 10115 Berlin, room 449

MIND

What is the relationship between the constructs of psychology and neuroscience? Do they capture how cognition works or should they be revised? Can we map them onto each other, and if so, how? This seminar will investigate these and related questions in light of recent philosophical and neuroscientific work on cognitive ontology. Topics will include multiple realisability of cognitive capacities, degeneracy and pluripotentiality of brain regions, methodology of fMRI studies, and the debate about the autonomy (or lack thereof) of psychology from neuroscience.

Wednesday 14:30 – 16:00 *start: 18 April 2018*

Topics in Philosophy of Psychology: Concepts and Mental Representation

Dr. Dimitri Coelho Mollo (Berlin School of Mind and Brain)

venue: Invalidenstraße 110, 10115 Berlin, room 449

MIND

The notions of concept and mental representation lie at the centre of many debates in the philosophy of psychology, and play an important role in several branches of the cognitive sciences. In this seminar, we will investigate the nature and explanatory role of these constructs, encompassing questions about what makes representations have the contents they do; whether concepts are representations or abilities; whether and to what extent representations and concepts are innate or learned; and whether to be realists, instrumentalists, or eliminativists about these notions.

Wednesday 16:30 – 18:00 *start: 18 April 2016*

Psychology of Emotions: From Mind to Brain

Dr. Dorota Kobylińska (University of Warsaw) / Juan Loaiza (Berlin School of Mind and Brain)

venue: Invalidenstraße 110, 10115 Berlin, room 449

MIND/BRAIN

The course will consist of two parts: more theoretical (Mind) and empirical (Brain). During the first part the main emotion theories in psychology will be covered (Basic emotion theory, Appraisal theories, and Constructionism) as well as we will go into some theoretical problems regarding emotions as natural kinds. During the second part we will concentrate on research that helped answering some basic questions concerning human emotions. Each topic of the second part will be illustrated with practical demonstrations prepared by the students (with help of a teacher), such as fragments of movies, mini experiments etc. We will also refer to theories while discussing research trying to find out which approach to emotions was chosen by the researchers.

Focus BRAIN

Monday 14:15 – 15:45 *start: 16 April 2018*

Visual context effects in languages processing

Prof. Dr. Pia Knoeferle (Institut für deutsche Sprache und Linguistik, HU Berlin)

venue: Dorotheenstraße 24, 10117 Berlin, room 3.318

BRAIN

Language processing is a task that we all manage rapidly and seemingly effortlessly. And yet, there are points in the comprehension process at which we may experience some difficulty. Which kinds of information can help us in understanding language (words, sentences, and discourse) as rapidly as we do (and what does 'understand' mean)? Would you treat all sorts of information in the visual context the same and is more information better? Would your reaction to context be the same as a child's? Based on a review of the literature on visual context effects in language comprehension this seminar will explore these and related questions.

References: Knoeferle, P. & Guerra, E. (2016). Visually situated language comprehension. *Language and Linguistics Compass*, 10, 66-82."

Wednesday 10:00 – 11:30 *start: 18 April 2018*

The Manipulation of Memory

Prof. Dr. Carsten Finke (Berlin School of Mind and Brain)/ Dr. Frederik Bartels (Berlin School of Mind and Brain) / Dr. Stephan Krohn (Berlin School of Mind and Brain)

venue: Invalidenstraße 110, 10115 Berlin, room 449

BRAIN

“Face It, Your Brain Is a Computer” was the title of an op-ed in The New York Time written by Gary Marcus, professor of psychology and neural science at New York University. In analogy, memory is frequently seen as hard drive, where we securely read and write our memories. However, while a hard drive exactly returns the initially stored information upon retrieval, our memory representations are dynamically changing and may be subject to a wide range of unnoticed alterations. In this seminar, we will learn about different ways our memory might be manipulated and will consider ethical and legal consequences of such manipulations. We will discuss (i) the seminal experiments of Elizabeth Loftus on false memories and more recent work on eyewitness testimony (ii) the mechanism of reconsolidation and ways of alterating memories by interfering with reconsolidation; (iii) recent studies that created false memories in rodents using optogenetic manipulation; (iv) studies investigating how to suppress unwanted memories; and (v) possible ways to enhance memory by pharmacologic interventions, cognitive training and deep-brain stimulation.

Wednesday 12:30 – 14:00 *start: 18 April 2018*

Applied Statistics

Luke Tudge (Berlin School of Mind and Brain)

venue: Invalidenstraße 110, 10115 Berlin, room 449

BRAIN

In this course, students will learn how to analyze data with statistical procedures, to report and visualize those analyses, and to interpret similar reports in the published literature. An introductory section of the course will provide some basic theoretical background on the two key concepts of probability and evidence, and how they can be quantified. After that, we will cover the most common statistical procedures typically encountered in an introductory statistics course, including *t*-tests, chi-square, correlation, regression, and analysis of variance. For each procedure, there will be a practical session in which students run the analyses themselves using the statistics software *R*, followed by a short homework assignment in which they report the results. No previous knowledge of statistics or of *R* is assumed. By the end of the course, students should have the necessary skills to analyze data from their own research projects.

Thursday 13:30 – 15:00 *start: 19 April 2018*

Python

Luke Tudge (Berlin School of Mind and Brain)

venue: Invalidenstraße 110, 10115 Berlin, room 449

BRAIN

Python is a free, flexible and relatively easy-to-use programming language. It has become a very popular tool in many fields of research, including cognitive science. Along with the Psychopy add-on, Python can be used to create psychophysical experiments. In this course, students will learn the basics of how to use Python and Psychopy. The first half of the course concerns Python itself, and covers writing basic commands, manipulating numbers and text, and reading and writing data files. The second half of the course concerns creating experiments with Psychopy. Classes will be based around practical demonstrations and tasks. No previous knowledge of Python or other programming languages is assumed; the course is aimed at complete beginners. By the end of the course, students should have the necessary skills to program and run a simple visual experiment with Python, and to save, manipulate and display the resulting data.

In general, this course is for *Mind and Brain students only* but if not all places are taken by our students we are happy to offer those places to interested students of other programs. If you are a student of another program and you would like to take the course, please send an email to the program coordinator who will put you on a waiting list: mb-education@hu-berlin.de (Dirk Mende).

Thursday 17:30 – 19:00 *start: 19 April 2018*

The Neurobiological Bases of Consciousness: An Evolutionary Perspective.

Dr. Antonella Tramacere (Max Planck for the Science of Human History, Jena)

venue: Invalidenstraße 110, 10115 Berlin, room 449

BRAIN

The pragmatic turn in cognitive science and, quite specularly, the embodied cognitive revolution in philosophy of mind gave new input to the study of consciousness and its neurobiological bases.

In contrast with the functionalist tradition, it is now stated that the characteristics and properties of the body play a constitutive role in the conscious states of an organism. Conscious states are instantiated by bodily and brain processes of interoception, proprioception and exteroception, and understood as multilevel or multidimensional constructs. Minimal states of consciousness are described as depending on interoceptive and proprioceptive contingencies, without the organism being aware of having an experience that counts as a self-experience. In contrast, objectified self-related mental states (self-models) entail the possibility to conceive the self as an agent separated from the others and from the world, and able to cope, through a subjective sense of reality, with a past and a future.

Different attempts are now made to connect these different levels or dimensions of consciousness with local or global neurobiological mechanisms, producing more questions than answers: at which point of brain development and evolution can we attribute these different conscious states? Identifying the emergence of a self-model with the possession of an organized neocortex would exclude non-mammals from the status of conscious subjects? And how can we explain apparent complex conscious states in animals with a relatively simple central nervous system, such as octopus or insects?

Thursday 15:30 – 17:00 *start: 19 April 2018*

Interpersonal Perception

Dr. Laura Kaltwasser (Berlin School of Mind and Brain)

venue: Invalidenstraße 110, 10115 Berlin, room 449

BRAIN

How do we perceive others? The seminar deals with the processing of social stimuli – covering psychological and neuroscientific research from basic principles of face cognition up to the influence of stereotypes onto social interaction. We want to revise classical and current literature regarding the complex interplay of interpersonal perception, social cognition and social interaction in everyday situations. Topics include the perception of faces, emotions, attributes, personality, intentions and

attractiveness, but also associated psychological processes such as empathy and stereotypes on the neurophysiological, cognitive and social level. A main emphasis will lie on interpersonal perception in terms of top-down influences.

Block Course

25-27 July 2018, 9:00 – 17:00

Metarepresentation and Metacognition

Dr. Richard Moore (Berlin School of Mind and Brain)

venue: Invalidenstraße 110, 10115 Berlin, room 449

MIND

Metarepresentation – the ability to think about representations – and metacognition – the ability to monitor cognitive processes – have been hypothesised to play a number of key roles in human life. For example, metacognition has been supposed to play an important role in action guidance and control (Proust); and metarepresentation is thought necessary for both mental time-travel, including episodic memory and future planning (Corballis, Suddendorf), and social cognition (Sperber). In this seminar, we will set out to clarify the nature of metacognition and metarepresentation – by considering whether they are elements of a single ability, or a number of related abilities. We will also consider and evaluate competing claims about the extent to which metarepresentation and metacognition are implicated in different aspects of human life, and possible sources of their development in ontogeny and phylogeny.

This class will be suitable for advanced students in the Philosophy of Mind and Psychology, and related cognitive sciences. It is not recommended to students with no background in this area of research.

Key texts:

Carruthers, P. (2009). Mindreading underlies metacognition. Behavioural and Brain Sciences, 32(2), 164-182.

Michaelian, K. (2016). Mental Time Travel: Episodic Memory and Our Knowledge of the Personal Past. MIT Press.

Proust, J. (2013). The Philosophy of Metacognition: Mental Agency and Self-Awareness. OUP.

Suddendorf, T. & Corballis, M. (2007). The evolution of foresight: What is mental time travel, and is it unique to humans? Behavioural and Brain Sciences, 30(3), 299-313.

Colloquia:

Tuesday 18:15 – 19:45 *start: 17 April 2018*

Philosophical Colloquium

Prof. Dr. Michael Pauen (Department of Philosophy, HU Berlin)

venue: Berlin School of Mind and Brain, Luisenstraße 56, 10117 Berlin, room 220

MIND

The weekly colloquium is open for advanced students and doctoral candidates who are interested in current debates in the philosophy of mind. We will discuss recent research papers as well as papers by the participants.

Participation by appointment only. Please contact my secretary Anja Mayer if you want to sign up for the colloquium: anja.mayer@hu-berlin.de.

Thursday 13:00 – 14:30 *start: 19 April 2018*

Research Colloquium

Prof. Dr. Isabel Dziobek (Institut für Psychologie, HU Berlin & Berlin School of Mind and Brain)

venue: Please contact mb-soccog@hu-berlin.de for information regarding the weekly changing venue.

BRAIN

If you have questions, please contact

Dr. Dirk Mende

mb-education@hu-berlin.de

+49 (0)30 2093 -1792

NB: The lectures/courses which are flagged as "For Mind and Brain students only!" are for Mind and Brain students only!

Please find information about the course requirements for student of other programs here:

http://www.mind-and-brain.de/master/external-students/

If you are a student of Humboldt-Universität zu Berlin, please register for our courses in the *Überfachlicher Wahlpflichtbereich* section of AGNES.

If you are a student of another university, please print out the Registration as guest auditor / visiting student form you find on our website: http://www.mind-and-brain.de/master/external-students/ **The form has to be signed by the lecturer of the class you plan to attend and the master's program coordinator (Dirk Mende).**