**Master program "Mind and Brain"**

**Berlin School of Mind and Brain**

**Humboldt-Universität zu Berlin**

**Summer Semester 2020**

| Monday | Tuesday | Wednesday | Thursday | Friday |
|---|---|---|---|---|
| 9:30 – 11:00<br>Haynes et al.<br>Neuroimaging | 9:00 – 10:30<br>Dziobek<br>Empirical Research Training<br>(MIND Track) | 10:00 – 11:30<br>Bayer<br>Emotions<br>(B) | 10:00 – 11:30<br>Finke<br>Cognitive Deficits in Neurological Diseases (B) | 9:00 – 10:30<br>Dziobek<br>Empirical Research Training<br>(BRAIN Track) |
| 10:00 – 11:30<br>Dziobek<br>Research Colloquium (B) | 10:45 – 12:15<br>Dziobek<br>Empirical Research Training<br>(MIND Track) | 12:30 – 14:00<br>Tudge<br>Applied Statistics<br>(B) | 12:45 – 14:15<br>Tutorial I & II:<br>Neuroimanging | 10:45 – 12:15<br>Dziobek<br>Empirical Research Training<br>(BRAIN Track) |
| 12:15-13:45<br>Knoeferle / Pulvermüller<br>Language and the Brain | 13:30 – 15:00<br>Coelho Mollo<br>Philosophy of Artifical Intelligence (M) | 14:30 – 16:00<br>Michael<br>Philosophical Foundations of Behavioural Economics (M) | 14:30 – 16:00<br>Tutorial I & II:<br>Neuroimaging | 13:15 – 14:45<br>Tutorial:<br>Palleschi/Boux<br>Language and the Brain |
| | 15:30 – 17:00<br>Michael<br>Philosophical Writing and Argumentation (M) | 16:30 – 18:00<br>Kozyreva / Schulze<br>Decision Making: Views from Philosophy and Psychology (M/B) | | 15:15 – 16:45<br>Tutorial:<br>Sofroni<br>Ethics and Neuroscience |
| 16:15 – 17:45<br>Cabeza<br>Memory and the Brain (B) | 18:15-19:45<br>Pauen<br>Philosophical Colloquium (M) | | | |

**Block course**: 27 – 30 July, 14:00 – 19:30: R. Cabeza, *Functional Neuroimaging of Episodic Memory* (B)

***Comprehensive Course Calendar***

***Mandatory Lectures***

*Monday 9:30 – 11:00* *start: 20 April 2020*

*Neuroimaging*

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

*venue: Ostertaghaus (House 4), Campus Nord, Philippstraße 12, 10115 Berlin, Lecture Hall 4*

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: 20 April 2020*

*This course will take place at two venues: The first half of the course will take place at Freie Universität Berlin in Dahlem, the second half will take place at Humboldt-Universität in Mitte.*

*The sessions at Humboldt-Universität: 20.04., 25.05., 08.06., 15.06., 22.06., 29.06., 06.07., 13.07. (final exam).*

*The sessions at Freie Universität: 27.04., 04.05., 11.05., 18.05.*

*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 at Humboldt-Universität: Ostertaghaus (House 4), Campus Nord, Philippstraße 12, 10115 Berlin, Lecture Hall 4*

*Venue at Freie Universität: Freie Universität, Otto-von-Simson-Str. 26, 14195 Berlin, Seminarzentrum, Room L113*

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, so that these psycholinguistic models could be tested in behavioral experiments. Most recently, neuro- and cognitive scientists have attempted to spell 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 specific lesions.

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, the computation of the meaning and of the communicative function of utterances. Language development and language disorders caused by disease of the brain will also be in the focus. To accommodate language processing, psycho- and neurolinguists make use of theoretical and computational models. The modeling approaches discussed range from theoretical models of the language system to language processing to (neuro-)computationally implemented models. 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).

*Preparatory readings:*

Knoeferle, P., & Guerra, E. (2016). Visually situated language comprehension. Linguistics and Language Compass, 10(2), 66–82. https://doi.org/10.1111/lnc3.12177

Munster, K., & Knoeferle, P. (2017). Situated Language Processing Across the Lifespan: A Review. International Journal of English Linguistics, 7(1), 1–13. https://doi.org/10.5539/ijel.v7n1p1

Pulvermüller, F., & Fadiga, L. (2016). Brain language mechanisms built on action and perception. In G. Hickok & S. L. Small (Eds.), Neurobiology of language (pp. 311-324). Amsterdam: Elsevier.

Pulvermuller, F. (2018). Neural reuse of action perception circuits for language, concepts and communication. Progress in Neurobiology, 160, 1-44. doi: 10.1016/j.pneurobio.2017.07.001

*Tuesday 9:00 – 12:15 (MIND Track)* *start: 28 April 2020*

*Friday 9:00 – 12:15 (BRAIN Track)* *start: Tue 28 (!!) April 2020*

*Empirical Research Training*

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

*venue: tba*

*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 12:45 – 16:00* *start: 23 April 2020*

*Tutorial: Neuroimaging*

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

*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: 24 April 2020*

*Tutorial: Language and the Brain*

*Isabella Boux (Einstein Center for Neuroscience Berlin), Daniela Palleschi (Einstein Center for Neuroscience Berlin)*

*venue:* Rhoda-Erdmann-Haus, Philippstraße 13, 10115 Berlin, room 1023

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: 24 April 2020*

*Tutorial: Ethics and Neuroscience*

*Razvan Sofroni (Institut für Philosophie, HU Berlin)*

*venue:* Rhoda-Erdmann-Haus, Philippstraße 13, 10115 Berlin, room 1023

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**

*Tuesday 13:30 – 15:00* *start: 21 April 2020*

Philosophy of Artificial Intelligence

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

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

*MIND*

In a seminal 1950 paper, Alan Turing asked: 'Can machines think?'. This seminar will revolve around ways to tackle this question. We will see how that seemingly straightforward question spawns several others: What are the requirements for an artificial system to count as intelligent? Which principles of organisation should guide its design? Is artificial intelligence possible at all? We will focus on conceptual issues concerning the development of artificial intelligence, actual and potential obstacles to such a project, while also looking at attempts, past and present, at designing and building intelligent systems. We will moreover examine ethical and social issues that (may) arise from the development of artificial intelligence.

*Tuesday 15:30 – 17:00* *start: 21 April 2020*

*Writing and Argumentation*

*Dr. John Michael (Institut für Philosophie, HU Berlin / Berlin School of Mind and Brain)*

*venue: tba*

*MIND*

The goal of this series of seminars will be to train students in the language and argumentation skills required for reading and writing philosophy. It is aimed at both philosophy students and, perhaps especially, graduate students from the non-philosophy cognitive sciences. Students will be trained not just in how to read and understand philosophical arguments, but also in how to critically evaluate them. The goal will be to enable students to argue with philosophers on their own terms – capable not just of appropriating philosophers' ideas for their own work, but to be able and confident to critically accept or reject and develop these ideas too. In the earlier parts of the course, we'll look at the nature of philosophical argument and key aspects of philosophical reasoning. Later we'll look at particular examples of philosophical argument in more detail, through close readings of a series of classic papers in the Philosophy of the Cognitive Sciences.

*Wednesday 14:30 – 16:00* *start: 22 April 2020*

*Philosophical Foundations of Behavioural Economics*

*Dr. John Michael (Institut für Philosophie, HU Berlin / Berlin School of Mind and Brain)*

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

*MIND*

Behavioural economics — and at its core game theory — provide a powerful tool for predicting and explaining human social behaviour. As such, it has been viewed as a unifying force able to bring together politics, economics, sociology, anthropology. In this course we will examine the assumptions about human psychology made by behavioural economists, and investigate questions raised by examining those assumptions: E.g What does it mean to be a rational agent? What are preferences and how stable are they? How do we know our own and others' preferences?

*Wednesday 16:30 – 18:00* *start: 22 April 2020*

*The Philosophy and Psychology of Memory*

*Dr. Anastasia Kozyreva (Max Planck Institute for Human Development, Center for Adaptive Rationality)*
*Dr. Christin Schulze (Max Planck Institute for Human Development, Center for Adaptive Rationality)*

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

*MIND / BRAIN*

In this course we will discuss, from the perspectives of philosophy and psychology, how people should and actually do make decisions under uncertainty. Bringing together these two perspectives will allow us to approach normative aspects of rational decision making formulated in decision theory as well as descriptive accounts based on empirical psychological research. We will study intricacies of and contradictions between normative and descriptive approaches to decision making and see how they can reinforce but also challenge one another.

In the first part of the course, we will address philosophical foundations of rational choice theory, discussing origins of the modern normative approaches to rationality and reasoning under uncertainty, as well as alternative models of bounded rationality. In the second part, we will turn to behavioral research from psychology on how people actually make judgments and decisions. We will discuss empirical findings from various research traditions that have investigated people's statistical reasoning abilities, their cognitive biases, fast-and-frugal heuristics, and decisions from experience.

**Focus BRAIN**

*Monday 16:15 – 17:45* *start: 20 April 2020*

*Memory and the Brain*

*Prof. Dr. Roberto Cabeza (Institut für Psychologie, HU Berlin / Duke University)*

*venue: tba*

The course provides an introduction to the domain cognitive neuroscience of memory. It covers theories and empirical studies on various memory systems, including working memory, implicit memory, semantic memory, and episodic memory. In each class, the instructor introduces a topic, students present an article on the topic, and questions are discussed. The articles read during the course include functional neuroimaging studies with healthy individuals and neuropsychological studies with brain-damaged patients. The goal of the course is to help students think critically about theoretical and methodological issues in cognitive neuroscience of memory.

*Wednesday 10:00 – 11:30* *start: 22 April 2020*

*Emotions*

*Dr. Mareike Bayer (Berlin School of Mind and Brain)*

*venue: tba*

*BRAIN*

The first part of the course covers a range of influential emotion theories. In the second part, we will discuss how we can study emotions and its subcomponents in an empirical fashion, considering evidence from several methods (EEG, MRI, autonomous nervous system activity, behavioral measures). We will also discuss the role of cultural, social and developmental influences on emotion, as well as the interplay of emotion and cognition. Finally, we will consider how clinical or neurological disorders can inform theories about emotions.

*Wednesday 12:30 – 14:00* *start: 22 April 2020*

*Applied Statistics* *- canceled until further notice !*

*Dr. Luke Tudge (Berlin School of Mind and Brain)*

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

*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 10:00 – 11:30* *start: 23 April 2020*

*Cognitive Deficits in Neurological Diseases*

*Prof. Dr. Carsten Finke (Berlin School of Mind and Brain)*

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

*BRAIN*

Almost all neurological diseases are associated with cognitive deficits, although frequently sensory or motor symptoms dominate the clinical presentation, e.g. in Parkinson's disease, multiple sclerosis or stroke. In this seminar, students will get to know the most common neurological diseases and their typical clinical manifestation with a specific focus on their distinct cognitive profiles. Recent studies investigating neural correlates of these cognitive deficits will be introduced. Students will learn about pathophysiological concepts and therapeutic strategies and whenever possible, patients will be invited to the classroom to report their symptoms and their view of the disease.

**Block course:**

*Block course: 27 – 30 July 2020, 14:00 – 19:30*

*Functional Neuroimaging of Episodic Memory*

*Prof. Dr. Roberto Cabeza (Institut für Psychologie, HU Berlin / Duke University)*

*venue: tba*

*Preparatory meeting: 4 June 2020, 18:00, venue: tba*

This advanced course focuses on critically reading and discussing recent articles in the subdomain of functional neuroimaging of episodic memory. These articles include theoretical papers, univariate activation studies, network studies, and representational analyses studies. The goal of the course is to help students identify open questions in this specialized literature, generate ideas for novel research approaches, including the writing of a "mock" grant application. Ideally, students should have a background in cognitive neuroscience research and/or memory research.

***Colloquia:***

*Tuesday 18:15 – 19:45* *start: 28 April 2020*

*Philosophical Colloquium*

*Prof. Dr. Michael Pauen (Institut für Psychologie, HU Berlin)*

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

*MIND*

The *bi-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 Ms Anja Papenfuss if you want to sign up for the colloquium: mb-admin@hu-berlin.de

*Monday 10:00 – 11:30* *start: 27 April 2020*

*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

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**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).**