Master program "Mind and Brain"

Berlin School of Mind and Brain

Humboldt-Universität zu Berlin

Winter semester 2022/2023

Monday	Tuesday	Wednesday	Thursday	Friday
10:00 – 11:30 Bermpohl/Brandt/ Bajbouj Lecture: Clinical Neuroscience	10:15 – 11:45 Brass Lecture: Basic Research Methods	8:30 – 10:00 Finke Tutorial: Clinical Neuroscience	10:00 – 11:30 Constant/Passler Metacognition (M/B)	9:00 – 10:30 Degutis Tutorial: Cognitive Neuroscience
	12:15 – 13:45 Brass Tutorial: Basic Resarch Methods	10:00 – 11:30 Brass Research Colloquium (B)	12:15-13:45 Haynes/Krickel Why and how should we investigate the brain to understand the mind? (M/B)	11:00 – 12:30 Ott Tutorial: Neuroanatomy and Neuro-physiology
12:30 – 14:00 Haynes Lecture: Cognitive Neuroscience		12:15 – 13:45 Hipólito Philosophical Foundations of Cognitive Science (M)		
14:30 – 16:00 Pauen Phenomenal States: Metaphysics, Epistemology, and Measurement (M)	Bi-weekly: 15:00 – 18:30 Kuvers et al. Computational modeling of collective behaviour and cognition (B)		16:15 – 17:45 Hipólito E-Cognition and Dynamical Systems (M)	14:15 – 15:45 Hildebrandt-Harangozó Tutorial: Philosophy of Mind
16:30 – 18:00 Soch Python (B)				
18:15 – 19:45 Pauen Philosophical Colloquium (M)				

Block courses: 4 - 7 Oct 2022, 9:00 –17:00 : D. Ott: Lecture: Neuroanatomy and Neurophysiology

10 – 14 Oct 2022, 9:00 – 15:30 : M. Pauen: Lecture: Philosophy of Mind

27 Feb – 3 Mar 2023 – J.-D. Haynes/Th. Schmidt : Lecture: Ethics and Neuroscience

9–12 Mar 2023–M. Wyrobnik: Introduction to EEG and Event-Related Potentials (B)

Comprehensive Course Calendar

Block courses:

Before the start of the semester:

D. Ott	*Neuroanatomy and Neurophysiology*	*4 - 7 Oct 2022 (p. 3)*
M. Pauen	*Basic Phil. Concepts and Philosophy of Mind*	*10 – 14 Oct 2022 (p. 3)*

After the end of the semester:

J.-D. Haynes / Th. Schmidt	*Ethics and Neuroscience*	*27 Feb – 3 March 2023 (p. 5)*
M. Wyrobnik	*Introduction to EEG and Event-Related Potentials*	*9 – 12 March 2023 (p. 12)*

Mandatory Lectures:

Block course: 4 - 7 October 2022, 9:00 – 17:00

Neurophysiology and Neuroanatomy

Dr. Derek Ott (Max Planck School of Cognition / Unfallkrankenhaus Berlin)

venue: Main building Faculty of Life Sciences Nordbau, Invalidenstraße 42, 10115 Berlin, Lecture Hall 7 (ground floor). You have to walk around the main building facing the street Invalidenstraße 42 and to a building in the backyard, opposite of the main building.

*Mind and Brain and Einstein Center for Neurosciences students **only**!*

The course provides a basic understanding of where (anatomy) in the brain what (physiology) happens. It is of particular value for those students whose background is mainly in a "mind" science such as linguistics or philosophy. Participating students will learn about the fundamental units of brain anatomy, such as lobes, areas, columns, etc. A special emphasis will be put on structure function relationship, i.e., which brain area is responsible for which aspect of brain function. It will be explained how brain areas interact, and what theories exist about bringing together aspects of information from different brain areas into one percept or thought (binding). The physiology part of the course will adress fundamentals of neuronal functioning, interaction of neurons, neurotransmission, and will provide an understanding of neurovascular coupling, a basis of the most important functional neuroimaging method, fMRI.

Block course: 10 – 14 Oct 2022, 9:00 – 15:30

Basic Philosophical Concepts and Philosophy of Mind

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

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

The course provides a systematic overview over the most central issues in the philosophy of mind. Participating students will learn to apply relevant philosophical concepts, they will be taught to construct a valid argument; they will learn how to distinguish between the most important options in the mind–body debate and how to assess the consequences of neuroscientific research.

Monday 10:00 – 11:30 *start: 24.10.2022*

Clinical Neuroscience

Prof. Dr. Felix Bermpohl (Klinik für Psychiatrie und Psychotherapie, Charité) / Prof. Dr. Stephan Brandt (Klinik für Neurologie, Charité) / Prof. Dr. Malek Bajbouj (Klinik für Psychiatrie und Psychotherapie, Charité)

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

*Mind and Brain and Einstein Center for Neurosciences students **only**!*

The course provides basic knowledge about the neuroscience of clinical psychiatry and neurology. Students will learn the basic pathophysiology of important disorders of the brain and how the brain reacts to these challenges. Participating students will learn (a) how alterations of different cognitive systems (e.g., emotion regulation, language, reward) result in mental disorders, (b) how these alterations can be studied using neuroscience methods, (c) how this knowledge may translate into therapeutic applications.

Ch. Zorumski/E. Rubin, *Psychiatry and Clinical Neuroscience*, Oxford 2014

Monday 12:30 -14:00 *start: 24.10.2022*

Cognitive Neuroscience

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, Bernstein-Center and Einstein Center for Neurosciences students **only**!*

The course provides an introduction to the field of Cognitive Neuroscience which is the study of the neural basis of perception, cognition, and behavior in the intact human brain. The course will cover core topics in Cognitive Neuroscience, including typical experimental paradigms and research methods.

A light introduction to Cognitive Neuroscience for beginners:

J. Ward. *The student's guide to cognitive neuroscience*. Psychology Press, 4th edition, 2019.

Tuesday 10:15 – 11:45 *start: 25.10.2022*

Basic Research Methods

Prof. Dr. Marcel Brass (Institut für Psychologie, HU Berlin / Berlin School of Mind and Brain)

venue: Main building Faculty of Life Sciences Nordbau, Invalidenstraße 42, 10115 Berlin, Lecture Hall 7 (ground floor).

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

This course intends to provide knowledge on the theoretical principles and practical applications of psychological research methods in general and neurocognitive methods in particular. It will cover predominantly important steps of conducting quantitative research such as research questions, the design of experiments, validity, types of data, and reporting results. Various technologies for measuring brain structure and function and the limitations of these techniques will also be covered, including functional magnetic resonance imaging (fMRI), event-related potentials (ERPs), transcranial magnetic stimulation (TMS). In addition, eyetracking, motion tracking and psychophysiological measures will be covered. Wherever possible, the course will allow for hands-on experience with the methods (cf. tutorial). The goal for students is to be able to understand the methods covered and critically evaluate research that uses them.

Block course: 27 Feb – 3 Mar 2023, 9:00 – 17:00

Winter School on Ethics and Neuroscience

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

Prof. Dr. Thomas Schmidt (Institut für Philosophie, HU Berlin)

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

Participants will be familiarized with basic ethical concepts and theories and will gain an overview of ethically relevant aspects of neuroscience. Thereby, participants will learn to know how ethical issues are tackled in philosophical ethics, and they will get an overall view of the theoretical interfaces between ethics and neuroscience.

Mandatory Tutorials:

Tuesday 12:15 – 13:45 *start: 25.10.2022*

Tutorial: Basic Research Methods

Prof. Dr. Marcel Brass / N.N. (Institut für Psychologie, HU Berlin / Berlin School of Mind and Brain)

venue: tba

Wednesday 8:30 – 10:00 *start: 26.10.2022*

Tutorial: Clinical Neuroscience

Prof. Dr. Carsten Finke (Charité – Universitätsmedizin Berlin / Berlin School of Mind and Brain)

venue: Alte Nervenklinik, Bonhoefferweg 2 (Studenteneingang), Charité Campus Mitte, 10117 Berlin, Seminarraum Level 3

Friday 9:00 – 10:30 *start: 28.10.2022*

Tutorial: Cognitive Neuroscience

Jonas Karolis Degutis (Max Planck School of Cognition)

venue: Bernstein Center for Computational Neuroscience, Philippstr. 13., 10115 Berlin, House 6, Lecture Hall (ground floor)

Friday 11:00 – 12:30 *start: 21.10.2022*

Tutorial: Neurophysiology and Neuroanatomy

Dr. Derek Ott (Max Planck School of Cognition / Unfallkrankenhaus Berlin)

venue: Bernstein Center, Philippstr. 13., 10115 Berlin, House 6, Lecture Hall (ground floor)

Friday 14:15 – 15:45 *start: 21.10.2022*

Tutorial: Philosophy of Mind

Franz Hildebrandt-Harangozó (Institut für Philosophie, HU Berlin)

venue: Bernstein Center, Philippstr. 13., 10115 Berlin, House 6, Lecture Hall (ground floor)

Elective Courses:

Focus MIND

Monday 14:30 – 16:00 *start: 24.10.2022*

Phenomenal States: Metaphysics, Epistemology, and Measurement

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

venue: Humboldt Graduate School, Luisenstraße 56, 10117 Berlin, room 144 (ground floor)

MIND

While classical mind-body problem was understood as an ontological question, the more recent discussion focuses on epistemological problems: Can we hope to explain consciousness in the way we explain other higher-level properties? Many philosophers think that the prospects are dim, particularly with respect to phenomenal states like pain or color experiences.
The present seminar will challenge this view. First, we will provide some historical background, demonstrating the origin of these problems in early modern philosophy. Second, we will discuss some of the well-known arguments allegedly showing that phenomenal states cannot be captured in functional terms and, therefore, evade a reductive explanation. We will also consider whether phenomenal states like pain can be measured in ways that physical properties can. Finally, in a somewhat speculative approach, we will try to better understand what kind of entities phenomenal states are, how they are related to bodily activities, and what an explanation might look like.

Literature:
Levine, J. (1983). Materialism and Qualia: The Explanatory Gap. Pacific Philosophical Quarterly, 64, 354-361.
Chalmers, D. J. (1995). Facing up to the Problem of Consciousness. Journal of Consciousness Studies II, 200-219.

Wednesday 12:15 – 13:45 *start: 19.10.2022*

Philosophical Foundations of Cognitive Science

Dr. Inês Hipólito (Berlin School of Mind and Brain / Institut für Philosophie, HU Berlin)

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

MIND

What is cognition? Is cognition inside our brain? What is the role of the body? What role does the environment play on cognition? How do cognitive beings know, believe and have certainties about the

world? What is a cognitive model? Does a cognitive model accurately represent cognition or is it an abstraction of a part of cognition? In recent decades cognitive science has revolutionised our understanding of cognition. Philosophy has made a major contribution to cognitive science and has itself been hugely influenced by its development. Philosophers, while attentive to traditional philosophical concerns, are increasingly drawing both theory and evidence from empirical disciplines. In this introductory-level philosophy seminar students will study both the main contributions that areas of philosophy such as epistemology, philosophy of mind and philosophy of science have contributed to cognitive science and the state-of-the-art set of new debates about cognition. Students will closely engage with and discuss both fundamental and recent papers and thought experiments presented in an interactive seminar setting.

Thursday 12:15 – 13:45 *start: 27.10.2022*

Why and how should we investigate the brain to understand the mind? – Mechanisms and mechanistic explanation in cognitive neuroscience

Prof. Dr. Beate Krickel (Institut für Philosophie, Literatur-, Wissenschafts- & Technikgeschichte, TU Berlin) / Prof. Dr. John-Dylan Haynes (Bernstein Center for Computational Neuroscience Berlin)

venue: Bernstein Center for Computational Neuroscience, Philippstr. 13., 10115 Berlin, House 6, Lecture Hall (ground floor)

MIND / BRAIN

The commitment to the brain-dependence of cognition has been an integral part of cognitive science from the very beginning. Yet it was traditionally thought that studying the brain was useless for understanding cognition. Cognition, so the common view, is to the brain like the software is to the hardware – and no one would look at the physical details of a computer to understand a computer program. This view has changed since the "cognitive neuroscience revolution" (Boone & Piccinini 2016). From the perspective of philosophy of science, this change is accompanied by a new view of what it means to successfully explain cognition. While traditional cognitive science has focused on explanation via functional analysis, cognitive neuroscience—according to philosophers of science—provides mechanistic explanations of cognition. In this seminar, we will take a closer look at the role mechanistic explanation and mechanisms play in cognitive neuroscience. We will address questions such as the following:

- What are mechanisms in cognitive neuroscience?
- How to mechanistic explanation in cognitive neuroscience?
- In which sense are mechanistic explanations of cognition explanatory?
- Which role do computation and representation have in mechanistic explanation?
- Are there other styles of explanation that cognitive neuroscientists use?

These questions will be addressed from the perspectives of contemporary philosophy of science as well as cognitive neuroscience.

Literature:

Boone, Worth, and Gualtiero Piccinini. 2016. "The Cognitive Neuroscience Revolution." Synthese 193(5):1509–34.

Thursday 16:15 – 17:45 *start: 20.10.2022*

E-Cognition and Dynamical Systems

Dr. Inês Hipólito (Berlin School of Mind and Brain / Institut für Philosophie, HU Berlin)

venue: Bernstein Center for Computational Neuroscience, Philippstr. 13., 10115 Berlin, House 6, Lecture Hall (ground floor)

MIND

Are facts about the nervous system sufficient to explain cognition? Can mental health sufficiently be explained by neural activity? Do brainless living beings possess cognitive capacities in their adaptation to survive their environments? Does intelligent cognition possess properties that do not reduce to the nervous system? In this seminar, we will explore the so-called E-Cognition positions (Embodied, Enactive, Extended, Ecological) as a rejection of the reduction of cognition to (neuro)cognitive processes. Specifically, we will appraise cognition in terms of dynamically unfolding, situated embodied interactions between the organism and aspects of their world. Further, we will examine E-cognition through the lens of the theory that seems equipped to formally respond to questions resulting from dynamical interactions with the environment — Dynamical Systems Theory. Students will closely engage with recent philosophical and dynamical systems work presented in an interactive seminar setting.

Focus BRAIN

Mon 16:30 – 18:00 *start: 31.10.2022*

Python

Dr. Joram Soch (Bernstein Center for Computational Neuroscience)

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

BRAIN

Strictly, Mind and Brain master's and doctoral students ONLY!

Python is a free, flexible and easy-to-use programming language. It has become a very popular tool in many fields of research, including cognitive science. In this course, students will learn basic programming techniques in Python and the use of Python for advanced topics such as psychophysical experiments or numerical data analysis. The main part of the course concerns Python itself and covers writing basic commands, manipulating numbers and text as well as reading and writing data files. The final part of the course concerns advanced methods in Python; the precise contents of this section will be fixed in the first sessions together with the students. 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 their own Python code, and to collect, manipulate, display and save their own data using Python.

Tuesday 15:00 – 18:30 (NB: bi-weekly course!) *start: 25.10.2022*

Computational modelling of collective behaviour and cognition

Dr. Ralf Kuvers (Max Planck Institute for Human Development) / Dr. Alan N. Tump (Max Planck Institute for Human Development) / Dr. Dominik Deffner (Max Planck Institute for Human Development)

venue: tba

BRAIN

Strictly, Mind and Brain master's and doctoral students ONLY!

This course will introduce students to computational models of collective behaviour and cognition. Such computational approaches can bridge the gap between the dynamics happening within and between agents in social groups, thereby mechanistically linking the individual and collective level. This ties together how (i) individual cognition drives social systems; (ii) the social environment drives individual cognition, and (iii) both levels interact.

We will combine introductory lectures with practical hands-on sessions in R. We will start with a general introduction to computational models of cognition and typical Bayesian workflows including

simulation, model fitting and parameter recovery. We then apply these methods to various computational models in social systems including models of (i) signal detection, (ii) evidence accumulation, and (iii) reinforcement learning. We will show how these approaches can help answer fundamental questions on social and collective decision making, such as when is it beneficial to learn from others (as opposed to on your own), and how do social learning strategies influence collective performance? A basic understanding of statistical theory and programming is recommended. By the end of the course, students are expected to have an overview over key concepts of Bayesian statistics and approaches to model decision making in social systems and will have developed step-by-step knowledge on the process of computational modelling of social systems.

Thursday 10:15 – 11:45 *start: 20.10.2022*

Theoretical and Neural Bases of Metacognition

Marika Constant (RTG Extrospection, HU Berlin) / Marlo Passler (RTG Extrospection, Otto-von-Guericke-Universität Magdeburg)

venue: Bernstein Center for Computational Neuroscience, Philippstr. 13., 10115 Berlin, House 6, Lecture Hall (ground floor)

MIND / BRAIN

Epistemic feelings such as uncertainty, confusion, feelings of knowing, or confidence are ubiquitous in our daily stream of consciousness. They enable us to monitor and control our ongoing cognitive processes, a capacity known as "metacognition". Recently, the study of metacognition in humans and nonhuman animals has gained prominence, and is having exciting implications for work on decision-making, learning, mentalizing, and theories of consciousness. However, there is an ongoing debate about which cognitive and neural processes really constitute metacognition, and which criteria should be used for measuring and attributing it. The aim of this seminar is to (i) introduce empirical methods and results from metacognition research, (ii) discuss their theoretical implications with respect to the competing theories of metacognition, and (iii) shed light on the idea of a constitutive link between metacognition and consciousness. To this end, we will examine both empirical and philosophical work. Students will gain insight into empirical approaches and neuroscientific advances in the study of metacognition and how these fit into the philosophical framework.

Block course:

Thur – Sun 9 – 12 March 2023, 9:30 – 15:30

Preparatory Zoom meeting: 25 Jan 2023 at 17:00 : https://hu-berlin.zoom.us/j/69978708659

An introduction to EEG and Event-Related Potentials

Michelle Wyrobnik (Charité – Universitätsmedizin Berlin / Berlin School of Mind and Brain)

venue: Charité - Universitätsmedizin Berlin, Campus Benjamin Franklin, Hindenburgdamm 30, 12203 Berlin, room: tba

BRAIN

In this course, you will learn about the neural origins of the EEG and how a typical EEG experiment in neuroscience is designed. Further, we will discuss what event-related potentials (ERPs) are and how they are linked to mental processes. Finally, you will learn about the preprocessing steps of EEG data and get a brief overview about the statistical analyses of ERPs.

Colloquia:

(Colloquia are courses for advanced master students in the final phase of their degree or doctoral candidates of a professor.)

Wednesday 10:00 – 11:30 *start: 26.10.2022*

Research Colloquium: Social Intelligence

Prof. Dr. Marcel Brass (Berlin School of Mind and Brain)

venue: Campus Nord, House 5, Philippstr. 13, 10115 Berlin. Please ring the doorbell!

Brain

The colloquium is open for advanced students who are interested in social and cognitive neuroscience.

Participation by appointment only. Please contact: mb-socintel@hu-berlin.de

Monday 18:15 – 19:45 *start: 24.10.2022*

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

Philosophical Research-Colloquium

venue: Luisenstraße 56, 10117 Berlin, room 224

MIND

The weekly colloquium is open for advanced students and doctoral students 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

If you have questions, please contact

Dr. Dirk Mende

mb-education@hu-berlin.de

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).