

A 2 Optional courses (OC)

Optional courses comprise specific scientific modules (OC-S), seminars for the development of communication and organization skills (OC-O), further vocational training (OC-V), and language courses (OC-L). Optional courses will be offered within the OCC but can also involve courses provided elsewhere in the university, e.g. in the M.Sc Program in Biology or Psychology and Sport Studies, and research modules taken outside the lab where the PhD research is conducted. In the following, a number of courses will be listed. The list is not exhaustive and might change over time. PhD students may propose additional courses they want to attend. The Program Commission (PC) will then decide about the acceptance of the course and the points to be credited for the participation.

Research module (OCC members and members of the Faculty of Biology)

Research modules are intensive courses for a small number of participants focusing on a particular project or methodology. They can cover different topics from cognitive and behavioral neuroscience and can be arranged between individual students and members of the OCC or the Faculty of Biology. A research module consists of 6-8 weeks of practical study on an individual project.

Each module is eight weeks, full time: 10 ECTS

Availability: continuously

Maximum ECTS in 3 years: 10

Basic neuroscience (Pape & Schwab)

German name in the official course listings: **“Vorlesung der Physiologie I (Neurophysiologie)”**

This lecture presents the basics of neurophysiology and functional neuroanatomy. The aim of the lecture is to ensure that beginning PhD students from various academic backgrounds gain the same level of knowledge about basic neurophysiological and -anatomical principles, thus laying the ground on which further courses and the studies of the doctorate can build. Topics are: structure and function of neurons; sensory systems, integrative functions of the central nervous system, motor systems, autonomic nervous system.

5 hours per week: 5 ECTS;

Available once per year (summer semester)

Maximum ECTS in 3 years: 5

Lecture in bioethics (Dept of Biology, various lecturers)

Introduction to bioethics, technological impact assessment, stem cells, "green" gene technology, transgenic animals, models of the ethical analysis of the embryonic state, ethics in the work with animals, scientific basics of nature conservation.

Aims: Reflection on the scientific practical work, communication of scientific principles for the assessment of ethical questions, teamwork

2 hours per week: 2 ECTS

Available once per year (summer semester)

Maximum ECTS in 3 years: 2

Lecture: Behavioral biology (Sachser)

This lecture gives an introduction into the main fields of behavioral biology: (1) the mechanisms of behavior accentuating the interplay between genes, hormones and the environment; (2) behavioral development focusing on environmental influences during sensitive phases of life; (3) behavioral ecology and sociobiology emphasizing the evolution of behavior.

1 hour per week: 1 ECTS

Available once per year (winter semester)

Maximum ECTS in 3 years: 1

Lecture: Brain structures, functions, and deficits (Lappe)

German name in the official course catalog: **“Neuronale Strukturen, Funktionen und Fehlleistungen”**

Introduction to the structure and function of the brain with particular emphasis on cognitive processes such as attention, memory, executive control, decision making.

2 hours per week: 2 ECTS

Available once per year (winter semester)

Maximum ECTS in 3 years: 2

Lecture: Experimental methods for cognitive and behavioral neuroscience (Schubotz, Vorberg, Bölte, Lappe, Zwitserlood)

German name in the official course catalog: **“Experimentelle Methoden der Neuro- und Verhaltensforschung”**

Introductory overview over the main experimental methods in cognitive and behavioral neuroscience in humans: psychophysics, signal detection theory, reaction time measurements, EEG, MEG, fMRI, PET, transcranial magnetic stimulation, computational modelling

2 hours per week: 2 ECTS

Available once per year (summer semester)

Maximum ECTS in 3 years: 2

Lecture: Transcranial electric and magnetic stimulation of the brain: From simulation to clinical applications in neurology and psychiatry, Part I (Wolters, Kugel, Lencer)

German name in the official course catalog: **“Elektrische und magnetische Hirnstimulation: Von der Simulation zur klinischen Anwendung in Neurologie und Psychiatrie, Teil I”**

Nowadays devices and tools are available for transcranial electric (tES) and/or magnetic (TMS) stimulation as well as for invasive intracranial stimulation of the human brain. This lecture will focus on mathematical methods for optimizing such stimulation approaches (e.g., multi-sensor tES and TMS).

2 hours per week: 2 ECTS

Available once per year (winter semester)

Maximum ECTS in 3 years: 2