Neurosciences
Master
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Description of the Study Programme

The neurosciences are among the most fascinating disciplines of the life sciences. They combine concepts and methods from biology, chemistry, physics, informatics, medicine and psychology in order to understand the function of the nervous system. Neuroscience research has a tremendous impact on our society, since it deals with the functioning and malfunctioning of the brain – the organ that governs our thinking, feeling and our behaviour.

The programme is designed to educate students for excellent research in the neurosciences. Close collaboration with other institutes of the University of Bremen and our extensive exchange with partner universities all over the world contribute to rich possibilities of specialising in various fields of the neurosciences.

The compulsory modules in the first semester provide basic theoretical knowledge, together with practical skills (programming and laboratory animal sciences) which are essential for the practical modules in the second semester (Advanced Studies I). Here, the students choose three modules from a catalogue of eight advanced studies. In the third semester two seven-weeks lab rotations will follow, which can also be performed abroad or in other institutions in Germany. These courses aim at the consolidation and application of advanced theoretical and practical knowledge in the area of experimental design, scientific work and communication. The studies end with the master's thesis (duration: six months). Courses are given in English.

Admission Criteria and Requirements

- To apply for the study programme, applicants must hold a bachelor's degree (or equivalent) in biology, physics, psychology or computer sciences, or a related field. In addition, 60 CP are required in one or several of the following disciplines: Zoology, human biology, biopsychology or neuropsychology, biochemistry, cell biology or molecular biology, genetics, statistics/mathematics, medicine/clinical neurology, physics, chemistry, or closely related fields.
• English level C1 Common European Framework of Reference for Languages (unless the last academic degree was obtained from a university, in which the primary language of instruction was English).

• An essay (letter of motivation) explaining why you choose this programme and what your research interests are.

**Recommended qualifications:**

• Basic knowledge and lab experience in biology, physics, medicine or psychology.

• High motivation in understanding complex systems.

The selection board will evaluate the applications according to the following criteria: Overall grade of the previous degree (max. 80 points), letter of motivation (max. 20 points). If there are more applicants than vacant study places (20), applicants will be admitted according to their rank determined in the evaluation.

**Career Perspectives**

This interdisciplinary Master programme provides students with a broad background in the neurosciences as well as with the possibility to specialise in a favourite subject. Equipped with the basics of the life sciences, in combination with fundamental theoretical, methodological and practical knowledge in the various fields of the neuroscientific and cognitive sciences, they will be qualified for a career in a great variety of science-related occupations.

We educate students to become critically thinking scientists. Not only do they receive extensive research experience qualifying them for PhD studies and an academic career. The acquired scientific, technical and communication skills also open a broad spectrum of additional opportunities. There are job opportunities in industry, e.g. pharmaceutical branch, medical technology, robotics, industrial engineering, biotechnology and neuroimaging.
Curriculum

First term

The Master of Neurosciences programme is divided into a curriculum of modular courses. Description of contents of the individual modules can be taken from the web page: www.masterneuro.uni-bremen.de/en/masterneuro

• **Cellular and Molecular Neurosciences and Mentoring**
  *Module 401-1 (M. Koch)*

• **Systemic Neurosciences**
  *Module 402 (U. Dicke/A. Kreiter)*

• **Theoretical Neurosciences**
  *Module 403-1 (K. Pawelzik)*

• **Clinical Neurosciences**
  *Module 404 (M. Herrmann)*

• **Programming**
  *Module 414 (U. Ernst and K. Pawelzik)*

• **Laboratory Animal Science**
  *Module 415 (M. Koch, A. Kreiter, S. Mandon and collaborators)*

For each module 6 Credit Points (CP) can be obtained.
Second term
After an introductory week in the second semester, the basics acquired in the first semester are taken to an advanced level and applied in practical training (internships of 4 weeks duration each). Students choose from three compulsory optional subjects. Detailed descriptions can be taken from the web page.

- **Neuro- and Electrophysiology**  
  *Module 406 (A. Kreiter)*

- **Neuropharmacology II**  
  *Module 407 (M. Koch)*

- **Experimental Neuroanatomy and Behavioral Physiology**  
  *Module 408 (U. Dicke)*

- **Psychophysics and Human Neurophysiology**  
  *Module 409 (M. Fahle)*

- **Experimental Neuropsychology**  
  *Module 410 (M. Herrmann/T. Fehr)*

- **Cognitive Psychology and Electroencephalography**  
  *Module 411 (C. Basar)*

- **Structural and Functional Neuroimaging**  
  *Module 412 (M. Herrmann, E. Küstermann)*

- **Neurophysics**  
  *Module 413 (K. Pawelzik)*

- **Theoretical Neurosciences**  
  *Module 403-1, c) Computational Neuroscience II (U. Ernst/K. Pawelzik)*
In the second term students decide according to individual preferences. "Advanced Studies I" emphasises the development of scientific meta-skills more than former courses. The independent acquisition of information (professional literature), gleaning and critical handling of data, analytical strategies of problem solving, cooperativeness and teamwork skills and scientific communication capacity in speech and writing will be advanced and practised. 9 credit points can be achieved in each module and 3 credit points are given for the introductory week.

Third term
In the third term, emphasis is on subject-related qualifications and the development of meta-skills. Here students achieve more independence during two seven-week lab-rotations ("Advanced Studies II" with 15 CP each). Lab-rotations can also be done at selected institutes, clinics or hospitals in Germany or abroad. These courses particularly aim at the consolidation and application of advanced theoretical and practical knowledge and training abilities in the field of experimental design and scientific communication.

Fourth term
At this point students are prepared to accomplish their Master's thesis in the fourth semester (within six months) either in one of the departments of their choice or partly at various institutes or enterprises at home and abroad.
(Research) Co-operations

There are cooperations with various institutes at the University of Bremen as well as with Bremen hospitals and the Centre for Advanced Imaging (CAI). In addition there is an extensive exchange with partner universities all over the world.

Application Deadline

April 30
January 15 (advance students only)

Application Procedure

Please use the application form on the web page www.masterneuro.uni-bremen.de/en/application/forms and www.uni-bremen.de/master and follow the guidelines for application presented there.

Start of the Study Programme

Courses of the M.Sc. programme Neurosciences start in the winter term (October) or in the summer term (April, advanced students only) of each year.

Duration of Study

The M.Sc. programme includes 120 ECTS (European Credit Transfer System) which is the equivalent of four semesters of full-time study.

Degree

Master of Science (M.Sc.) in Neurosciences

Language of Instruction

English
Lecturers
This programme is provided by the members of the Centre for Cognitive Sciences (Zentrum für Kognitionswissenschaften - ZKW). The following lecturers are involved (heads of the department are marked in bold typescript):

Institute for Psychology and Cognitive Neuroscience Research
Prof. Dr. Canan Basar-Eroglu, Dr. Christina Schmiedt-Fehr, Dr. Birgit Mathes

Brain Research Institute, Department of Behavioral Physiology and Developmental Neurobiology
Prof. Dr. Ursula Dicke, Prof. Dr. Dr. Gerhard Roth

Institute for Brain Research IV, Human Biology
Prof. Dr. Manfred Fahle, Dr. med. Karoline Spang

Institute for Brain Research V, Department of Neuropsychology and Behavioral Neurobiology
Prof. Dr. Dr. Manfred Herrmann, PD Dr. Thorsten Fehr, Dr. Daniela Galashan, Dr. Margarethe Korsch, Dr. Ekkehard Küstermann

Institute for Brain Research II, Department of Neuropharmacology
Prof. Dr. Michael Koch

Institute for Brain Research III, Department of Theoretical Neurobiology
Prof. Dr. Andreas Kreiter, Dr. Sunita Mandon, Dr. Detlef Wegener

Institute for Theoretical Physics, Neurophysics
Prof. Dr. Klaus Pawelzik, Dr. Udo Ernst

Number of students in the first semester
Limitation to 20 students
Contact and Advisory

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www.masterneuro.uni-bremen.de

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