



DEPARTMENT OF CHEMISTRY AND MOLECULAR BIOLOGY

BIO501 Neurobiology, 15 credits

Neurobiologi, 15 högskolepoäng

Second Cycle

Confirmation

This course syllabus was confirmed by Department of Chemistry and Molecular Biology on 2018-04-18 and was last revised on 2022-11-25 to be valid from 2022-11-28, spring semester of 2023.

Field of education: Science 100%

Department: Department of Chemistry and Molecular Biology

Position in the educational system

This is a second-cycle course in Biology. The course can be included as a part of a Bachelor's degree in Molecular Biology and Biology, or as part of a Master's degree in Molecular Biology, Biology or Genomic and Systems Biology. The course is also offered as a separate course.

Main field of studies

Molecular Biology with Specialization in Genomics and Systems Biology
Biology

Molecular Biology

Specialization

A1N, Second cycle, has only first-cycle course/s as entry requirements

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Entry requirements

For admission to the course, approved courses of 120 credits in the field of natural science are required, of which at least 15 credits must be within the main subject molecular biology or equivalent. In addition, applicants must prove their knowledge of English: English 6/English B from Swedish Upper Secondary School or the equivalent level of an internationally recognized test, for example TOEFL, IELTS.

Learning outcomes

On successful completion of the course the student will be able to:

Knowledge and understanding

- Know and understand the key concepts in neurobiology, such as classes receptors and transmitter systems
- Understand basic anatomy and functions of the nervous system
- Understand the principles of nerve cell function, synaptic transmission and propagation of neural signals
- Understand the functions of sensory systems
- Understand the function of higher functions in nervous systems and how these can be studied
- Understand the development of nervous systems
- Understand motor systems and the regulation of these
- Understand the neurobiological principles of learning and memory, sleep, emotions and consciousness
- Explain the molecular mechanisms of neurodegeneration
- Understand the methodological aspects of studying the nervous system such as electrophysiology, optogenetics, EEG, neuroimaging

Competence and skills

- Be able to understand sensory transduction and understand connections between regulation of molecular mechanisms in nervous systems and how this influence higher order functions
- Be able to present and discuss basic concepts of neurobiology, such as voltage dependent membrane permeabilities and sensory functions
- Present and discuss topics within neurobiology in a broader perspective

Judgement and approach

- Be able to reason around molecular concepts within neurobiology
- Demonstrate critical thinking around the use of different model systems in neuroscience research

Course content

This course will explore the structure and function of the mammalian nervous system by examining the molecules, cells, and circuits that are involved in directing behavior. We will discuss how the nervous system is built during development, how it changes with experience throughout life, how it functions in normal behavior, and how malfunctioning communication between neurons and other cells leads to neurological

diseases. The course will also cover basic and functional neuroanatomy.

Form of teaching

Teaching will be performed through lectures, group assignments and voluntary practicals.

Language of instruction: English

Assessment

Written final examination, 15 credits

The written examination is given three times every year: a regular examination at the end of the course and two extra examinations. In case of illness or other compelled absence, the examination will take place after completing the instructions of the course coordinator and examiner.

A student who has failed a test twice has the right to change examiner, if that is possible. The application shall be sent to the head of the institute and has to be in writing.

Grades

The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U).

For grade G, the student is required to pass the written examination. For the grade VG, pass with distinction on the written examination.

Course evaluation

An evaluation will be done at the end of the course in the form of verbal dialogue with the students and a anonymous questionnaire. The results of the evaluation will be communicated to the students and will serve as a guide for the development of the course.