

**Advanced Neurobiology, 5.0 credits**

Avancerad neurobiologi, 5.0 hp

Third-cycle education course

8FO0149

Department of Biomedical and Clinical Sciences

Valid from: First half-year 2025

**Approved by**  
The Research and PhD studies  
Committee

**Approved**  
2024-05-06

**Registration number**  
LiU-2024-00225

## Entry requirements

Entry requirement for studies on third-cycle education courses

- second-cycle degree,
- 240 credits in required courses, including at least 60 second-cycle credits,  
or
- acquisition of equivalent knowledge in some other manner

Specific information

Normally, the course language is English.

## Learning outcomes

By the end of the course the students will be able to:

Knowledge and Understanding

- Identify, describe, and thoroughly explain complex neurobiological phenomena.
- Relate neurobiological phenomena to cellular and molecular mechanisms.

Skills and Abilities

- Acquire, evaluate, and synthesize knowledge from various biological and medical fields relevant to neurobiology.
- Integrate acquired knowledge with current research in medical neurobiology.
- Use common techniques in neurobiological research.

Judgement and Approach

- Evaluate and discuss results from scientific publications in neurobiology.
- Evaluate and discuss results obtained through experimental studies in neurobiology.
- Critically assess the possibility to successfully apply a selected neurobiological concept to one's own research project.
- Reflect on one's need for further neurobiological knowledge and the necessity of continuous skills development.

## Contents

The course covers current knowledge in neurobiology at an advanced level, as well as methods for studying the nervous system. Focus is on current research areas within neurobiology. More specifically, the course includes:

- Molecular mechanisms for nerve communication.
- Neurodegenerative diseases: molecular mechanisms.
- Development and plasticity of the nervous system.
- Behavior and higher functions.
- Review of scientific articles.
- Ethics.

## **Educational methods**

The pedagogical approach applied at the Faculty of Medical and Health Sciences is student centered, problem-based learning (PBL). The student takes responsibility for his/her own learning and seeks and evaluates information and knowledge based on own queries and formulated problems. The role of the teacher is to guide and support the students.

Educational methods applied in this course are lectures, tutorial groups, laboratory work and seminars.

## **Examination**

### **Examination**

The course is examined through an individual written report that is presented and defended orally and through a critical review of another student's report.

In addition, active participation in compulsory elements is required for passing the course, and these are continuously evaluated. By active participation is meant that the student contributes with work, input and / or own reflections with relevance to the task. The compulsory elements are tutorial groups, seminars and laboratory work.

For students who have already completed the course at advanced level, examination is only required through an individual written report which is presented and defended orally at a seminar, and through critical examination of another student's report, in order for the requirements for credits at the postgraduate level to be met.

Students who fail are offered one re-examination occasion in close connection to the course. After that participation in a coming course examination is offered. The re-examination should be equally comprehensive as the ordinary examination.

### **Change of examiner**

Students who have failed the course or part of the course twice are entitled to request another examiner for the following examination occasion.

### **Grading**

Pass or Fail

## **Grading**

Two-grade scale

## **Course literature**

A list of recommended literature will be provided by the course coordinator before the start of the course.

## **General information**

The course is planned and carried out according to what is stated in this syllabus. Course evaluation, analysis and suggestions for improvement should be fed back to the Research and PhD studies Committee (FUN) by the course coordinator. If the course is withdrawn or is subject to major changes, examination according to this syllabus is normally offered at three occasions within/in close connection to the two following semesters.