



T-624-NEEL

NEURO-ELECTROPHYSIOLOGY

6 ECTS

<b>Year of study:</b>	3 <sup>rd</sup> year BSc / 1 <sup>st</sup> year MSc.
<b>Semester:</b>	Spring.
<b>Level of course:</b>	3. First cycle, advanced / 4.-5. Second cycle, introductory-intermediate.
<b>Type of course:</b>	Elective. <i>Maximum attendance is only 12 students.</i>
<b>Prerequisites:</b>	Necessary prerequisites include: molecular biology, physiology and chemistry.
<b>Skipulag:</b>	Runs for 3 weeks – 4 teaching hours a day.
<b>Umsjónarkennari:</b>	Karl Ægir Karlsson.
<b>Kennari:</b>	Karl Ægir Karlsson.

**Learning outcome:** Following a successful completion of the course the student should be able to:

- Describe the basic electrical properties of neurons and the ionic basis of membrane potentials
- Describe the basic elements of an electrophysiology recording system
- Describe and critically compare the different electrophysiological recording preparations (e.g. extracellular, intracellular and patch-clamp recordings) and be able to express which questions each method is best suited to address
- Describe and compare different types of tissue preparations
- Describe the most common ways of manipulating neural activity in during electrophysiological recordings
- Understand and be able to carry out standard electrophysiological data analysis (e.g. ionic current calculations, current-voltage curves and spike sorting).

**Content:** The course is centered on a set of hands-on exercises:

- A) preparation of tissue slices (using *Danio rerio*) for recording;
- B) set of recordings and manipulations;
- C) data will be analyzed and
- D) turned in poster format.

**Reading material:** Papers, book chapters and other hand-outs will be delivered by the teacher.

**Teaching and learning activities:** The course is first and foremost hands-on in a laboratory setting. Under instructor

guidance the students set-up recording apparatus, prepares tissue samples for recording, records neural activity, and analysis data. Formal lectures will be kept to a minimum, the lectures are few and seminar style.

**Assessment methods:** Students will be rated on participation in hands on practicums (good attendance is critical), three take home exams and a poster format presentation of data. No final exam.

**Language of instruction:** English (lectures, materials, exams and posters are all in English only).

**All course descriptions may be subject to change.** Revised information on the course schedule, reading material, teaching and learning activities, and assessment methods will be introduced in the learning management system Canvas at the beginning of the semester.