



**T-860-NEUR NEURO-SCIENCE AND TECHNOLOGY**

**6 ECTS**

**Year of study:** 4<sup>th</sup> year (1<sup>st</sup> year MSc).

**Semester:** Fall.

**Level of course:** 4. / 5. Second cycle, introductory / intermediate.

**Type of course:** Elective. *Recommended elective for MSc Biomedical Engineering.*

**Prerequisites:** Students entering the course are expected to know the basics of molecular biology, cell biology, physiology and electronics.

**Schedule:** Runs for 12 weeks – 6 teaching hours a week.

**Supervisor:** Karl Ægir Karlsson.

**Lecturer:** Karl Ægir Karlsson.

**Learning outcome:** N/A

**Content:** In this course the anatomy of brain and spine, from molecules to basic structures will be discussed. Three main themes of brain function will be presented in detail: development, plasticity and brain repair; learning and memory; and genes circuits and behavior. In addition, the basic knowledge utilized in electrophysiology, brain modelling and neural and spinal electrical stimulation will be covered, including generation of electrical signals and the physiology of excitable cells. Methods of electrographic recordings presented include: in vitro and in vivo recordings, patch-clamp, intracellular, extracellular, field potential and electroencephalography.

**Reading material:** No textbook is required, all materials are provided by the teacher.

**Teaching and learning activities:** The course is taught seminar style - where students present chapters/papers to the class.

**Assessment methods:** Assessments are given for the quality of the in-class presentation (understanding of the material, questions raised, etc) and for the in-class exam given after each module of the class. There are two presentations for each student which account for 40% of the grade (20% each) and three short exams, 20% each. There is no final exam.

**Language of instruction:** English.

**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.