

Neuroelectronic Recording and Processing

This course will explore the components of state-of-the-art neurotechnology devices that are capable of recording from the nervous system and using the information for consumer or clinical purposes.

The asynchronous online modules focus on:



Module 01

Neural Recording Technology Overview

A guide to selection of neural recording methods, binary conversion of neuroelectric potentials, and an exploration of the latest commercial tech.



Module 02

Electrode-Tissue Interface

A review of common electrode types, acquisition of neural signals, evaluating electrode characteristics, and modelling electrode-tissue interactions.



Module 03

Cleaning and Digitizing Brain Signals

A study on amplification and digitization schemes, troubleshooting noise removal, and digitally processing data.



Module 04

Neural Signal Processing

A practice in advanced digital signal processing, as well as implementation of information extraction from neural signals.

Timeline

Course must be completed in
11 weeks

Completing course takes
approximately

50 hours

Tech Requirements

Regular access to a computer and
a stable internet connection

Compatible internet browser
(Google Chrome is recommended)

Google Colab

Prerequisites

Completion of the Neuroscience and
Neurotech Primer course

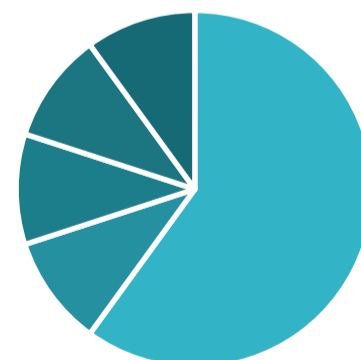
Learning Outcomes

1. Describe the acquisition and digitization process of neuroelectric potentials.
2. Investigate the electrode-tissue interface using signal theory, electrical engineering concepts, and equivalent circuit models.
3. Analyze neural signals to extract information about behaviourally relevant events.
4. Describe practical limitations of current technology and how those may be overcome.

Assessments

A pass in this course requires
achievement of an overall grade of 70%.

4x **10%**
Asynchronous
Quizzes
(1 per module)



60%
Final
Synchronous
Oral Exam

Contact Information

Content and Accommodation Related Questions:

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Health Sci Ed Connect (HSEC) Technology Support:

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