

Neuro-engineering Science (E010382)

Due to Covid 19, the education and evaluation methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

Course size (nominal values; actual values may depend on programme)

Credits 3.0 Study time 90 h Contact hrs 25.0 h

Course offerings and teaching methods in academic year 2020-2021

A (semester 1)	English	Gent	seminar: practical PC room classes	5.0 h
			lecture	20.0 h

B (semester 1) Dutch

Lecturers in academic year 2020-2021

van Mierlo, Pieter	TW06	lecturer-in-charge
Keereman, Vincent	TW06	co-lecturer

Offered in the following programmes in 2020-2021

	crdts	offering
Master of Science in Biomedical Engineering	3	A
International Master of Science in Biomedical Engineering	3	A
Master of Science in Biomedical Engineering	3	B

Teaching languages

Dutch, English

Keywords

Neurobiology, EEG, MEG, neuroimaging techniques, Structural and functional brain connectivity, Brain Computer Interfaces, Neuromodulation.

Position of the course

This course aims to give the students insight into the functioning of healthy brains and how these are affected in most common neurological disorder. Different techniques to measure the signals of the brain and to modulate the function of specific brain areas will be described.

Contents

- Introduction to working mechanism of the brain
- Overview of neurological disorders
- Neuroimaging techniques
- Elektro-encefalography (EEG) and Magnetoencephalography (MEG)
- Structural and functional brain networks
- brain computer interfaces
- Techniques for neuromodulation (DBS, TMS, VNS, tDCS, cortical stimulation).

Initial competences

no specific (Biomedical imaging is useful basis for this course)

Final competences

- 1 Have insight in the working principles of the brain and a basic knowledge of most common neurological disorders.
- 2 Have an insight in the background, methods and interpretation of the different techniques to measure brain activity and signals.
- 3 Understand the different neuromodulation techniques and how these are used to study the function of specific brain structures and to influence regions in neurological disorders.

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences

assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Guided self-study, lecture, seminar: practical PC room classes

Extra information on the teaching methods

- lectures
- Matlab practica

Learning materials and price

powerpoint slides + notes via VTK

References

Course content-related study coaching

Evaluation methods

end-of-term evaluation and continuous assessment

Examination methods in case of periodic evaluation during the first examination period

Written examination with open questions

Examination methods in case of periodic evaluation during the second examination period

Written examination with open questions

Examination methods in case of permanent evaluation

Report

Possibilities of retake in case of permanent evaluation

examination during the second examination period is not possible

Extra information on the examination methods

Written open book examination

Calculation of the examination mark

Periodical evaluation (75%) + non-periodical evaluation (25%)

Second examination period: only periodical evaluation