GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2024-2025

Neurobiology (D012511)

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

Credits 5.0 **Study time 150 h**

Course offerings and teaching methods in academic year 2024-2025

A (semester 2)	English	Gent	lecture

Lecturers in academic year 2024-2025

Carrette, Evelien	GE34	lecturer-in-charge
LAUREYS, GUY	GE34	co-lecturer
Meurs, Alfred	GE34	co-lecturer
Raedt, Robrecht	GE34	co-lecturer
Sprengers, Mathieu	GE34	co-lecturer

Offered in the following programmes in 2024-2025	**crdts**	**offering**
Master of Science in Biomedical Sciences	5	A

Teaching languages

English

Keywords

Neurophysiology, neuroplasticity, neuromodulation, neuropsychology, pharmacological and non-pharmacological treatment, cognitive sciences, experimental animal models for neurological diseases, cell death, neuroinflammation, epilepsy

Position of the course

This course explores specific aspects of neurobiology. The course aims to provide deeper insight into the regulation of excitability and plasticity of neurons and neuronal networks. Techniques applied to experimental (animal) models and humans to better understand the neurobiological basis of behavior and brain disorders will be explored. The neurobiology of a number of brain disorders such as epilepsy and multiple sclerosis is discussed. Finally, the in-depth insights are applied to the interpretation and presentation of a recent research paper.

Contents

Brain development and evolution.
Cellular neurophysiology and neurotransmission.
Mechanisms of neuroplasticity and neuromodulation.
Neural stem cells and neurogenesis.
Techniques for measuring and modulating neuronal activity (neurophysiology, functional imaging, neurostimulation, opto- and chemogenetics).
Principles of experimental (neuro-)psychology and behavioral research.
Assessment of cognitive and mental functions of specific brain structures.
Use of experimental animal models.
Neuroinflammation
Epilepsy

Initial competences

You can download the list of prerequisites on qoasis.ugent.be/oasisweb/curriculum/voorkennisvancursus?cursuscode=-&taal=nl
Having completed the bachelor degree in biomedical sciences or having acquired the relevant ending objectives by other means.

Final competences

1 To have knowledge and insight into cellular neurophysiology
2 To have knowlegde and insight into techniques to measure brain activity in patients and animal models
3 To have knowledge about and insight into the mechanisms of neuroplasticity
4 To have knowlegde about the role of specific brain structures in (human) behavior
5 Have knowledge of the principles of experimental and clinical neurobiological and neurocognitive research.
6 To understand research techniques for evaluating cognitive and mental function
7 To have knowledge about and insight into translational research in neurosciences and selected experimental animal models for neurological diseases such as epilepsy, multiple sclerosis, neurodegenerative diseases
8 The student is capable of summarizing current state of knowledge of a specific domain in the field of neurobiology and present it.
9 To have knowledge about the mechanisms of neuroinflammation
10 Correctly evaluate the relevance of published research results, indicate their limitations, and propose solution-oriented modifications to make an original contribution to neurbiological research.
11 Report on research to peers in a national and international context in a critical and clear manner orally and in writing

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

Lecture

Study material

Type: Slides

Name: Powerpoint slides per course afternoon
Indicative price: € 5
Optional: no
Language : English
Available on Ufora : Yes
Online Available : Yes
Available in the Library : No
Available through Student Association : No
Additional information: Slides will be available online when the course is given.

References

Principles of Neural Science, 4th Edition. Kandel & Schwartz, 2000
Fundamental Neuroscience, 3th Edition. Squire, 2008.
Introduction to Brain and Behavior, 4th Edition, Kolb and Wishaw, 2014

Course content-related study coaching

Permanent opportunity to ask questions via e-mail

Assessment moments

end-of-term and continuous assessment

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

Written assessment with multiple-choice questions, Written assessment with open-ended questions

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

Written assessment with multiple-choice questions, Written assessment with open-ended questions

Examination methods in case of permanent assessment

Oral assessment, Peer and/or self assessment

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible in modified form

Extra information on the examination methods

Non-periodic evaluation: microteaching will be scored by the course titular combined with peer evaluation

Calculation of the examination mark

Periodic evaluation counts for 80% and non-periodic evaluation for 20%.
Participation to non-periodic evaluation is essential to pass for this course.
Unauthorized absence will lead to a total score maximum of 9/20 regardless the score of the periodic evaluation.