GHENT UNIVERSITY

Course Specifications

Valid in the academic year 2024-2025

Physiological Regulation in Animals (C003352)

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

Credits 5.0 **Study time 135 h**

Course offerings and teaching methods in academic year 2024-2025

A (semester 2)	English	Gent	excursion
			lecture

Lecturers in academic year 2024-2025

Braeckman, Bart	WE11	lecturer-in-charge

Offered in the following programmes in 2024-2025	**crdts**	**offering**
Master of Science in Teaching in Science and Technology(main subject Biology)	5	A
Master of Science in Biology	5	A
Exchange Programme in Biology (master's level)	5	A

Teaching languages

English

Keywords

Homeostasis, physiological regulation, nervous system, endocrine system.

Position of the course

Based on the knowledge acquired in the course 'Introduction to Animal physiology' and 'Cell biology', students will gain in this course an in-depth view on the physiological regulation systems in vertebrates, in particular the nervous and endocrine system will be covered at a cellular as well as molecular level.

Contents

In this course an in-depth view on the physiological regulation systems in vertebrates is given, in particular the nervous (Part I) and endocrine (Part II) system will be covered at a cellular as well as molecular level.

PART I: NERVOUS SYSTEM

1 Introduction

2 Functioning
- Building blocks
- Transmembranic transport of molecules
- Stimulation and conduction of stimuli
- Synaptic transmission
- Neurotransmitters and their receptors

3 Organization
- Introduction
- Sensoric nervous system
  - Introduction
  - Pain
  - Sensoric modality: sight
    - Retina
    - Photoreceptor cells
    - Imaging in the retina
    - Connection between eyes and brain
    - Primary visual cortex
    - Visual association cortex
- Motoric nervous system
  - Mediated by the muscular system

- Leading to behavior
  - Reflex bow associated
  - Rhythmic and random
- Autonomous nervous system
  - Introduction
  - Components
    - Sympathetic
    - Parasympathetic
    - Enteric
  - Mediated by neurotransmitters
  - Control of autonomous functions
    - Thermoregulation
    - Instinctive behavior and emotions

4 Higher functions
- Awareness
  - Components
    - RAS
    - Thalamus
    - Cortex
  - Electro-encephalogram
  - Levels of awareness
- Learning and memory
- Cerebral dominance and language

PART II: ENDOCRINE SYSTEM

1 Introduction

2 Functioning
- Introduction
- Types
  - Messengers that diffuse through the cell membrane
  - Messengers that operate via cell membranic receptors

3 Tissues
- Pancreas
  - Insulin
  - Glucagon
  - Somatostatine
  - Pancreatic polypeptide
- Hypothalamus - Pituitary
  - Hypothalamus
  - Pituitary
    - Neuropituitary
    - Adenopituitary
- Thyroid
  - Anatomy
  - Synthesis and secretion
  - Regulation
  - Transport and metabolism
  - Action
- Adrenal
  - Anatomy
  - Types of hormones
    - From the medulla
    - From the cortex
- Reproductive system
  - Sexual differentiation from a common origin
  - Common aspects in gonodal function
  - Specific aspects per sexe
    - Testes
    - Ovaria

Excursions:
Dependent on the availability, an excursion is planned to a neurophysiological laboratory and/or a guest speaker is invited for a lecture on the topics of the course.

Initial competences

The student must have successfully followed the courses 'Cell Biology', 'Biochemistry', and 'Introductory Physiology'.

Final competences

1 Understanding the relation between the anatomy and function of the nervous system.
2 Being able to describe basic neurophysiological phenomena.
3 Understanding the relation between the anatomy and function of the endocrine system.
4 Being able to describe basic endocrinological phenomena.
5 Understanding the integration of neuronal and endocrine signals.

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

Excursion, Lecture

Study material

Type: Syllabus

Name: Physiological Regulation in Animals: text
Indicative price: € 6
Optional: no
Available on Ufora : No
Online Available : No
Available in the Library : No
Available through Student Association : Yes

Type: Syllabus

Name: Physiological Regulation in Animals: slides
Indicative price: € 22
Optional: no
Available on Ufora : No
Online Available : No
Available in the Library : No
Available through Student Association : Yes

References

- Physiology (Berne and Levy), Elsevier, 2007 (ISBN: 0323054471, 9780323054478)
- Review of Medical Physiology, 26st ed (W.F. Ganong), Mc Graw Hill, 2019 (ISBN: 9781260122404, 1260122409)
- Physiology of Behavior (N.R. Carlson), Pearson Education, 2016 (ISBN: 9781292158105, 1292158107)

Course content-related study coaching

At all time, questions can be raised during college or electronically via Ufora.

Assessment moments

end-of-term assessment

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

Oral assessment, Written assessment

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

Oral assessment, Written assessment

Examination methods in case of permanent assessment

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible

Calculation of the examination mark

- Periodical evaluation (100%)