

Physiological Regulation in Animals (C003352)

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 5.0 Study time 135 h Contact hrs 40.0 h

Course offerings and teaching methods in academic year 2020-2021

A (semester 2)	English	Gent	microteaching	1.25 h
			excursion	2.5 h
			lecture	30.0 h

Lecturers in academic year 2020-2021

Aerts, Johan WE11 lecturer-in-charge

Offered in the following programmes in 2020-2021

	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 membranec 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

Tutorials:

Using a relevant for this course A1-peer reviewed paper the student will give a powerpoint presentation and will actively participe in the discussion of that of his/her fellow students.

Excursions:

Two excursions will be organized to a neurophysiological (Part I of this course) and a endocrinological (Part II of this course) laboratory, respectively.

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.
- 6 Being able to synthesize and communicate scientific literature in the field of physiological regulation.

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, microteaching

Learning materials and price

Approximate cost Syllabus: 30 EUR

References

- Physiology (Berne and Levy), Mosby, 1998
- Review of Medical Physiology, 21st ed (W.F. Ganong), Mc Graw Hill, 2003
- Physiology of Behavior (N.R. Carlson), Allyn and Bacon, 1998

Course content-related study coaching

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

Evaluation methods

end-of-term evaluation and continuous assessment

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

Written examination

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

Written examination

Examination methods in case of permanent evaluation

Assignment, report

Possibilities of retake in case of permanent evaluation

examination during the second examination period is possible in modified form

Calculation of the examination mark

- Periodical evaluation (80%)
- Non-periodical evaluation (20%).

In case of unauthorized absence during the non-periodical part (microteaching and excursions) a zero score will be given for this part.

The marks for the non-periodical evaluation are again taken into account in the second examination period.