

Physiology and Pathophysiology I (G000720)

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

Credits 8.0 **Study time 240 h** **Contact hrs** 90.0h

Course offerings and teaching methods in academic year 2022-2023

A (semester 1)	Dutch	Gent	lecture	65.0h
			practicum	25.0h

Lecturers in academic year 2022-2023

De Schauwer, Catharina	D108	lecturer-in-charge
Delesalle, Catherine	D104	co-lecturer
Hostens, Miel	D108	co-lecturer
Pardon, Bart	D108	co-lecturer

Offered in the following programmes in 2022-2023

Bachelor of Science in Veterinary Medicine	crdts	offering
	8	A

Teaching languages

English, Dutch

Keywords

Comparative physiology and pathophysiology, basic concepts of physiology, general concepts related to growth & tumoral growth of cells, regenerative physiology, bone and cartilage tissue, muscle tissue, blood and blood-forming organs, respiratory system, kidney and urinary tract, reproductive system.

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Position of the course

This course consists of 6 blocks:

BLOCK 1: Basic concepts of physiology

BLOCK 2: Physiology of growth / Regenerative physiology

BLOCK 3: Physiology and pathophysiology of the blood and blood-forming organs

BLOCK 4: Physiology and pathophysiology of the respiratory system

BLOCK 5: Physiology and pathophysiology of kidney and urinary tract

BLOCK 6: Physiology and pathophysiology of reproduction

In the course Physiology & Pathophysiology I the focus is on the one hand on the normal, physiological functioning of organ systems in the body, and on the other hand insight is gained into the processes that can disturb these physiological bodily functions. The course focuses on integrative thinking, across the animal species, whereby the student is made aware of the dynamic nature of the (patho) physiological processes. The aim is to gain in-depth insight into important (patho) physiological processes that take place in healthy and sick animals. Both practical and fundamental research examples will be cited to make it clear to the student where the subject matter is of great importance in later professional life.

This course builds on and deepens the knowledge acquired in the courses: Study of

vertebrates and general anatomy of pets, Cell biology and general tissue science, and Bio-organic chemistry.

The course is part of the Bachelor's degree program and forms the basis for numerous courses in further education.

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Contents

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In Block 1: important basic concepts from physiology are discussed, such as osmosis, filtration, diffusion, homeostasis and homeorhesis. From there, the intra- and extracellular cell communication via receptors (types), second messenger systems, and sensors is also discussed in more detail, with a brief discussion of their pharmacological influence (prof. De Schauwer).

In block 2: important general concepts of the physiology of growth are discussed. This block also examines the growth of stem cells in more detail, with attention being paid on the one hand to regenerative medicine and on the other hand to the development of cancer (prof. De Schauwer). Furthermore, the growth of bone and cartilage tissue (prof. De Schauwer) and growth and metabolism of muscle tissue (prof. Delesalle) are also discussed.

In Block 3: the physiology and pathophysiology of the blood and the blood-forming organs is discussed, in particular the different types of cells in the blood and their function in the body (prof. De Schauwer).

In Block 4: all facets of the physiology and pathophysiology of respiration are covered (prof. De Schauwer and prof. Pardon).

In Block 5: all aspects of physiology and pathophysiology of the kidney and urinary tracts are covered (prof. Delesalle).

In Block 6: all facets of reproduction physiology and pathophysiology are discussed, in particular the different cycle types in pets, hormonal regulation, spermatogenesis, fertilization, gestation, partus, puerperium and lactation (prof. De Schauwer). In addition, attention will also be paid to the importance of reproduction in contemporary cattle farming (Dr. Hostens).

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Initial competences

This course builds on certain final competences of the following courses: Study of vertebrates and general anatomy of pets, Cell biology and general tissue science, Embryology and Teratology, Inorganic chemistry, Bio-organic chemistry and Biomedical physics and radioprotection.

For students only registered for a credit target contract, registration is only possible after having met the final competences of the first bachelor.

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Final competences

- 1 To have a clear insight into the basic concepts of physiology and pathophysiology*
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- 2 To be able to translate basic concepts from physiology and pathophysiology into clinical situations and to reason them: how and why?*
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- 3 Understand that these basic concepts are all dynamic processes that are interacting with each other in both healthy and diseased animals*
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- 4 To have a clear insight into the physiology and pathophysiology of the concept of growth and how growth is achieved in the different tissues*
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- 5 Understand how regenerative medicine depends on the concept of growth*
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- 6 Gain a clear insight into the physiology and pathophysiology of the bone and*

- cartilage tissue*
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- 7 *Gain a clear insight into the physiology and pathophysiology of the muscle tissue*
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- 8 *Gain a clear understanding of the physiology and pathophysiology of the blood and blood-forming organs*
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- 9 *Obtain a clear insight into the physiology and pathophysiology of the respiratory system*
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- 10 *Understand the basic concepts of exercise physiology and be able to reason energy metabolism under normal physiological and pathophysiological conditions*
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- 11 *Obtain a clear understanding of the physiology and pathophysiology of the kidney and urinary tract*
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- 12 *Obtain a clear insight into the physiology and pathophysiology of the reproductive system*
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- 13 *Thorough knowledge of positive and negative hormonal feedback loops and being able to translate this into in vivo physiological and pathophysiological situations of the treated tissues*
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- 14 *To have insight into possible interactions between different hormones*
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- 15 *Realize the importance of acquiring cross-species knowledge*
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- 16 *To realize the importance of understanding what happens under normal physiological conditions in the healthy animal and what happens under pathophysiological conditions in the sick animal*
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- 17 *To be able to assess a physiological and pathophysiological situation from different perspectives*
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- 18 *Realize the importance of integrative thinking across animal species and organ systems*
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- 19 *Learn to think dynamically and realize that physiological and pathophysiological processes never stand alone, but always influence each other dynamically*
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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

Practicum, Lecture

Extra information on the teaching methods

The lectures are the primary form of education. The course material will be given through regular and clinical lectures, using PowerPoint presentations. Plenary exercises are made in an interactive way on a regular basis.

The practicals are all interactive and are given in small groups of 20 to 25 people (depending on the subject). In the practicals both group work and guided self-study are discussed, the results of which are then discussed in the form of a seminar. The students discuss in small groups different assignments that are worked out during the practicals. The practicals are fully in line with the course and aim to deepen the course material and integrate knowledge.

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Learning materials and price

The learning material consists of handouts and images discussed during the lectures. The handouts and images are available on Ufora (print it yourself). In addition, 3 physiology books are recommended as reference material (Textbook of Veterinary Physiology, Cunningham; Textbook of Medical Physiology, Guyton and Hall; Review of Veterinary Physiology, Larry R. Engelking). These books are not an obligation, but a useful addition to the handouts of the lectures.

The practicals are also available through Ufora and the learning material always consists of a practical manual, the necessary sources that must be consulted in preparation and handouts. Sample questions are also on Ufora.

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References

Handouts of lectures and practicals

Manual practicals

3 physiology books as a reference work

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Course content-related study coaching

No formal study guidance is provided.

Personal by electronic appointment and personal approach after class or during the practicals. Handbooks are proposed for support but do not constitute a compulsory subject matter.

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Assessment moments

end-of-term and continuous assessment

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

Written examination with multiple choice questions

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

Written examination with multiple choice questions

Examination methods in case of permanent assessment

Participation, Written examination with multiple choice questions, Job performance assessment, Assignment

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

Period bound evaluation (written test) consisting of 60 multiple choice questions. The taught material that was discussed during the semester (lectures & practicals) will be tested (insight & knowledge). It is discussed with the students how the exam will proceed. Sample exam questions are regularly given about the course. A make-up exam during a given exam period is only possible in a modified form (open questions).

Non-periodical evaluation of the practicals: is based on active commitment, willingness to teamwork, knowledge and skills of the student. In view of the permanent evaluation, active participation in all practicals is mandatory (see examination regulations in the event of absence). Students who have not been able to participate in the practicals due to illness, provide the secretariat with an official certificate and must perform a replacement activity. At the end of each practical, a series of questions to be solved is immediately given or a Ufora task is opened that remains accessible for 1 day.

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Calculation of the examination mark

The final score for Physiology I & Pathophysiology I is the sum of the results of the period-linked exam with 60 multiple choice questions (18 out of 20 points) and the practical grade of the non-period-linked evaluation (2 out of 20 points).

Students who withdraw from the compulsory practicals are not declared to have passed this course unit.

Total score for the practical, the result obtained on the respective question series or Curio tasks per practical and the effort and participation per practical.

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Facilities for Working Students

Please contact the secretariat of the Department: secretariaat.DI01@UGent.be

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