GHENT UNIVERSITY

Course Specifications

Valid in the academic year 2022-2023

Physiology and Pathophysiology II (G000862)

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

Credits 7.0 **Study time 210 h** **Contact hrs** 85.0h

Course offerings in academic year 2022-2023

A (semester 2) Dutch Gent

Lecturers in academic year 2022-2023

Delesalle, Catherine	DI04	lecturer-in-charge
De Schauwer, Catharina	DI04	co-lecturer
Hostens, Miel	LA22	co-lecturer
Leybaert, Luc	GE33	co-lecturer
Pardon, Bart	DI08	co-lecturer

Offered in the following programmes in 2022-2023	**crdts**	**offering**
Bachelor of Science in Veterinary Medicine	7	A

Teaching languages

English, Dutch

Keywords

Comparative Physiology and Pathophysiology, accross species, water balance, hormones within and outside the Hypothalamo-hypophysiary axis, endocrinology, metabolism, blood analysis, cardiovascular system, neuromuscular system, digestive system, skin and integument, thermoregulation, physiology at farm level.

Position of the course

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This course consists of 11 sections:

SECTION 1: Water balance and acid base balance
SECTION 2: Physiology and pathophysiology of the hypothalamo-pituitary axis
SECTION 3: Physiology and pathophysiology of the hormones outside the hypothalamo-pituitary axis.
SECTION 4: blood test: basic concepts
SECTION 5: Physiology and pathophysiology of the cardiovascular system
SECTION 6: Skin & Integration & Thermoregulation
SECTION 7: Physiology and pathophysiology of the neuromuscular system
SECTION 8: Physiology and pathophysiology of the digestive system
SECTION 9: Physiology at Farm level
Physiology & Pathophysiology II is the course that deals with knowledge transfer concerning the normal physiological functioning of organ systems and knowledge about disturbances in normal (physiological) body functions, through which diseases and thus symptoms of diseases can arise. In addition, the way these pathophysiological changes in organs lead to disease symptoms, are addressed across species. The course focuses on integrative thinking and making the student aware of the existence of dynamic processes. The intention is that the student gains in-depth insight into a series of important physiological and pathophysiological processes. The student learns to combine the acquired knowledge about functioning of the different organ systems under healthy conditions with knowledge about pathophysiological processes. This creates a broad helicopter view on how everything functions in a healthy state and which cascade systems can be activated and influence each other under pathophysiological conditions. The emphasis is on how processes are triggered, how thy evolve and how they influence each other and not on getting acquainted with differential

diagnoses. The first steps are being taken to establish the link between physiological thinking and explaining the manifestation of certain clinical symptoms, findings during clinical examination and reasoning about possible diagnostic approaches and even treatment. Increasingly, throughout the course, efforts are being made to integrate organ systems to understand the coherence of derailments in the body. An important aim of the course Physiology & Pathophysiology II is to gain insight into the coherence of the different physiological and pathophysiological mechanisms that play a role within the total organism. The subject matter is taught on the basis of both practical examples and examples from fundamental research, with regular attention being paid to actualities in the news and the social impact of certain problems. The student obtains a clear view on where the acquired knowledge is of great importance in later professional life. This course builds on and deepens the knowledge acquired in the courses Anatomy, Cell Biology and General Tissue, Inorganic Chemistry, Embryology and Teratology, Bio-Organic Chemistry, Ethology, Epidemiology, Medical Physics and Physiology & Pathophysiology I.

The course is part of the Bachelor's degree program and forms an important and broad basis for numerous courses in the further veterinary education curriculum and is indispensable for the later professional life in veterinary practice.
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Contents

In Section 1: the water balance is discussed. The normal regulation of the water balance: osmolarity, water intake and loss of water. The role of hormones and the kidney, as well as pathophysiological concepts such as dehydration, hypovolaemia, acidosis, alkalosis, etc. are discussed

In Section 2: important physiological and pathophysiological concepts of the hypothalamo-pituitary axis are discussed. This section also deals in more depth with frequently occurring endocrinological disorders in various animal species and humans.

In Section 3: important physiological and pathophysiological concepts are discussed concerning hormones that are not regulated by the hypothalamo-pituitary axis. This section also deals in more depth with frequently occurring endocrinological disorders in various animal species and humans.

In Section 4: the basic concepts of blood testing are taught.

In Section 5: In this section all important physiological and pathophysiological concepts concerning the cardiovascular system are discussed. The structure and function of the heart and the large blood vessels are discussed, under both physiological and pathophysiological conditions. Concepts such as mechanical and electrical heart cycle, pressure-volume loops, blood pressure, arrhythmia and heart murmur (souffle) and basic concepts of ECG are discussed.

In Section 6: skin, integument & thermoregulation are discussed.

In Section 7: In this Section all physiological and pathophysiological concepts concerning the neurological system are discussed. Ultrastructure and functioning are discussed for the autonomous, the somatic nervous system and the senses. The energetic metabolism of the brain is discussed, to obtain insight into complex energy-demanding processes

In Section 8: In this section all physiological and pathophysiological concepts concerning the digestive system are discussed. The function, motility and secretion of the gastrointestinal tract under normal physiological and pathophysiological conditions will be discussed in more detail.

In Section 9: In this section the first steps are taken to learn to think physiologically at farm level

Initial competences

Thorough knowledge of anatomy, cell biology and general histology, inorganic chemistry, embryology and teratology, bio-organic chemistry and Physiology & Pathophysiology I are required.
For students who are 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 realize the importance of understanding what happens under normal physiological conditions in the healthy animal and what happens under pathophysiological conditions in the diseased animal.
To have a clear insight into the basic concepts of physiology and pathophysiology
2 To be able to translate basic concepts from physiology and pathophysiology into clinical situations and to reason them: how and why?
3 To understand that these basic concepts are all dynamic processes that are intraunited with each other in both healthy and diseased animals.
4 To have a clear insight into the physiology and pathophysiology of the cardiovascular system.
5 To have a clear insight into the physiology and pathophysiology of the skin, integument and thermoregulation.
6 To have a clear insight into the basic concepts of blood testing.
7 To have a clear insight into the physiology and pathophysiology of the water balance.
8 Realize the importance of acquiring knowledge accross animal species.
9 To realize the importance of having insight into what happens to the healthy animal under normal physiological conditions and what happens to the sick animal under pathophysiological conditions.
10 To be able to assess a physiological and pathophysiological situation from different perspectives.
11 Realize the importance of integrative thinking across animal species and organ systems.
12 Learn to think dynamically and realize that physiological and pathophysiological processes never stand alone, but always influence each other dynamically.
13 Understand the added value of international and intercultural competences.
14 To have a clear insight into the physiology and pathophysiology of the neuromuscular system.
15 To have a clear insight into the physiology and pathophysiology of the hormones that are regulated and not regulated by the HPA axis.
16 To have a clear insight into the physiology and pathophysiology of the functioning of the digestive system.
17 Realize the importance of being able to translate the acquired physiological and pathophysiological knowledge to farm level and this for different animal species and target groups, under different geographical and cultural conditions
18 Internationalization@home: By means of life guest lectures furnished by veterinary specialists abroad, students can get aquainted with Internationalization, diversity in visions and also diversity in veterinary cases seen in various specialized and Universitary Clinics

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

Extra information on the teaching methods

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

The practicals are all interactive and are given in small groups. 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 elaborated during the practicals. The practicals are fully in line with the course and aim to deepen the course knowledge and to integrate knowledge.

Learning materials and price

The Couse material consists of handouts and images discussed during the lectures. The handouts and images are available on Ufora. 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 on 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 to be found on Ufora.

References

Handouts of the Courses and Practicals to be found on the Ufora website and need to be printed-out by the students
Instructions for the practical courses (Ufora website)
3 books as reference work

Course content-related study coaching

No formal study feedback is provided.
Personal feedback by electronic appointment and personal approach after class or during the practicals is advised. Handbooks are proposed for support

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; see example on Ufora) consisting of 60 multiple choice questions. The taught material that was discussed during the semester (lectures, video material & practicals) will be tested (insight & knowledge). It is discussed with the students how the exam will proceed. An extra exam session that is organised within the same exam period is only possible under the form of open questions.

Non-periodical evaluation of the practicals: is based on active commitment, willingness to perform in team, level of 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, will provide the secretariat with an official medical certificate and must carry out a replacement task. At the end of each practical, a series of questions to be answered is immediately delivered or a Curio task is opened that remains accessible for 1 day, unless the practical session is organised on Friday, in which case the deadline will be postponed until the evening of the first following official teaching day.

Calculation of the examination mark

The final score for Physiology & Pathophysiology II 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 will be declared as not have passed this course unit.
Total score for the practical, the result achieved on the respective Curios duties / questions series per practical and the effort and participation per practical.

If one does not participate in the evaluation of one or more components or has less than 10/20 for at least one of the components, one can no longer pass the entire course. If the final score would nevertheless be a figure of ten or more out of twenty, this will be reduced to the highest fail mark (9/20)

Facilities for Working Students

Please contact the secretariat of the Department: secretariaat.DIO1@UGent.be