

Course size (nominal values; actual values may depend on programme)  
Credits 12.0 Study time 360 h Contact hrs 96.0 h

Course offerings and teaching methods in academic year 2018-2019

B (semester 1)	Dutch	guided self-study	3.75 h
		PDE tutorial	10.0 h
		practicum	7.5 h
		seminar	6.25 h
		clinical seminar	2.5 h
		lecture	62.5 h
		lecture: plenary	2.5 h
		exercises	

Lecturers in academic year 2018-2019

Van de Voorde, Johan	GE09	lecturer-in-charge
D'Herde, Katharina	GE05	co-lecturer
Ferdinande, Liesbeth	GE22	co-lecturer
Gettemans, Jan	GE07	co-lecturer
Leybaert, Luc	GE05	co-lecturer

Offered in the following programmes in 2018-2019

<a href="#">Bachelor of Science in Medicine</a>	crdts	offering
	12	B

Teaching languages

Dutch

Keywords

Cardiovascular system, respiratory system, kidney and urinary tract, anatomy, histology, physiology, radio-anatomy, embryology.

Position of the course

To integrate knowledge of the normal structure, function and development of the cardiovascular system, the respiratory system, the urinary tract and the kidneys. This course is an element of the different courses on the body systems that are scheduled in 1st and 2nd bachelor year. This course prepares the student for clinical courses of the systems that are programmed in the later years.

Contents

**Cardiovascular system** Embryology: development of the heart, the blood vessels and the foetal circulation. Anatomy: heart structure, course of the aorta and its branches, pulmonary arteries, systematics of the veins, portal circulation, lymphatic system. Histology: general structure of the blood vessels, arterial system, microcirculation, venous system, heart, lymphatic system. Physiology: origin and continuation of the impulse in the heart, working of the heart pump, haemodynamics of the greater circulation and the lymphatic circulation, regulation of the blood circulation, circulation in specific vascular areas, examples of cardiovascular mechanisms of adaptation (effort, orthostatism). Biochemistry: metabolism of the haem ring, synthesis and role of the eicosanoids (prostaglandins, thromboxanes, leukotrienes), importance of cyclo-oxygenases, mechanism of hemostasis. Radio anatomy of the cardiovascular system in a sound body.

**Respiratory system** Embryology: development of the face, nasal cavity, sinuses and respiratory system. Anatomy: nasal cavity and sinuses, pharynx, larynx, thoracic wall

and diaphragm, thoracic cavity with the topography of the mediastinum, main tracheae and bronchia, pleural cavities, lungs, surface anatomy of the thorax. Histology: conduct part, respiratory part, pleura, blood circulation. Physiology: lung ventilation, gas exchange between air and blood, transport of the breathing gases between lungs and tissues, regulation of the lung ventilation, examples of normal respiratory mechanisms of adaptation (effort, high altitude). Radio anatomy of the respiratory system in a sound body.

### **Urinary track and kidneys**

Embryology: development of the kidneys, the bladder and urethra, development of the auxiliary genital glands. Anatomy: kidney, ureter, bladder, prostate, male and female urethra, topography of the retroperitoneum and the small pelvis. Histology: kidney and drainage. Physiology: function of nephron (glomerular filtration, tubular absorption and secretion), role of the kidney in the regulation of water, sodium and potassium balance and the acid-base homeostasis, integration of the regulatory loops in the cardiovascular adaptation mechanisms. Radio anatomy of kidney and urinary tracks in a sound body.

#### **Initial competences**

This course requires knowledge of some competences gained in the courses "Cell I: Basics of physics and chemistry", "Cell II: Structure and functions" and "Cell III: Energy and metabolism".

#### **Final competences**

- 1 able to integrate scientific knowledge on development, structure and function of the respiratory system, heart and blood vessels, kidney and urinary tract.
- 2 able to integrate the knowledge on gas exchange and its disturbances and on transport of breathing gases in the blood.
- 3 able to integrate knowledge on respiratory regulation and adaptation to special conditions (exercise, altitude..).
- 4 able to integrate knowledge on the regulation of cardiac output, tissue blood flow, hemostasis, blood pressure and cardiovascular reflexes.
- 5 understand the basic functions of the kidney and the nephron.
- 6 understand the regulation of the balance of ions and water in the body and apply this knowledge in the context of selected clinical disease conditions.
- 7 gain practical competence in reporting observation and in measuring techniques (heart rate and spirometry).
- 8 able to localise structures on radiographical, anatomical and histological pictures of structures in thorax and abdomen.
- 9 able to integrate knowledge of the interaction between the cardiovascular system, the kidney and the electrolyte and water balance.
- 10 able to integrate knowledge of the cardiovascular system, respiration and kidney in clinical settings of emergency medicine.
- 11 - understand the origin of the important congenital aberrations in the cardiovascular system, respiratory system, kidney and urinary tract.

#### **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**

Guided self-study, lecture, PDE tutorial, practicum, seminar, lecture: plenary exercises, clinical seminar

#### **Extra information on the teaching methods**

Home study / response lecture histology: computer exercises with virtual microscopy  
Practicum physiology: spirometry and regulation of blood pressure  
Practicum anatomy: prosection practicum  
Work lectures: response sessions for anatomy, embryology, physiology and histology.  
Integrated interactive lectures physiology - emergency medicine.

#### **Learning materials and price**

Price: 25.0 euro.  
Syllabi:

- Unit book "Cardiovasculair stelsel, ademhaling, nier en urinewegen"

- K. D'HERDE. "Cardiovasculair stelsel, ademhaling, nier en urinewegen" syllabus and figures, Academia Press, Gent.

Histology:

- Powerpoint presentations with figures and histological photos (Minerva), practicum notes (Minerva) and virtual pictures of histological slides on Athena (OlyVIA)

- A-books: W. F. GANONG. Review of medical physiology. Lange Medical Books/Graw-Hill. (cfr. 2de bachelor: "Zenuwstelsel en zintuigen")

- B-book: (1) A.L. Mescher. Junqueira's Basic Histology. Text and atlas. 13th edition, Copyright 2013 The Mc Graw Hill Companies, ISBN 978-0-07-178033-9 ; (2) 'B. Young, P. Woodford, G. O'Dowd. Wheater's Functional Histology. A Text and Colour Atlas. 6th edition, Churchill Livingstone, Elsevier.

Other didactic material (illustrations, slides, ...): available on the electronic learning platform (minerva.ugent.be)

## References

### Course content-related study coaching

Students have ample opportunities to discuss the course with the teachers, either in group or in a personal contact: before or after the lectures or after an appointment with the teacher. A small number of questions can also be discussed through email. Practical exercises are organised in small groups (15 persons) which allows a direct contact with the students. In addition several response sessions are organised in which students questions are discussed. The coordinators of the persons responsible for the course are available at the start of the academic year.

### Evaluation methods

end-of-term evaluation and continuous assessment

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

Written examination with open questions, written examination with multiple choice questions

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

Written examination with open questions, written examination with multiple choice questions

### Examination methods in case of permanent evaluation

Participation, skills test

### Possibilities of retake in case of permanent evaluation

examination during the second examination period is possible in modified form

### Extra information on the examination methods

Theoretical examination using multiple choice questions, anatomical graphs, radiological images, histological slides, report on practical exercise. Unjustified absence from practical exercises and/or tutorials results in exclusion from participation to the theoretical examination.

### Calculation of the examination mark

The final result is calculated based on the result of the theoretical examination. The relative importance of every subdiscipline is based on the relative number of contact hours. For multiple choice questions the principle of standard setting is used. In this course consists of 3 partims: partim "physiology" 45 %, partim "anatomy" 27 %, partim "others" 28 %.

How to determinate the final result?

\* If the student obtains for each partim at least 50 %: the final result is the arithmetic mean of these 3 partims;

\* If the student doesn't obtain for each partim at least 50 %:

1. the number of points less than 10 /20 = 1 or 2, the final result is the arithmetic mean of these 3 partims
2. the number of points less than 10/20 > 2, the final result is reduced by a number y;  
Number y = the sum of points less than 10/20 (per partim) reduced by 2.

