



Faculty of Medicine

LÄKC31, Homeostasis, 30 credits

Homeostas, 30 högskolepoäng

First Cycle / Grundnivå

Details of approval

The syllabus was approved by The Medical Degree Programme Board on 2019-02-13 and was last revised on 2022-03-18. The revised syllabus applies from 2022-03-18, spring semester 2022.

General Information

The course makes up semester 3 of the Medical Programme and is compulsory.

Language of instruction: Swedish

Literature and teaching in English may be included.

Main field of studies

Medicine

Depth of study relative to the degree requirements

G1F, First cycle, has less than 60 credits in first-cycle course/s as entry requirements

Learning outcomes

Knowledge and understanding

For a Pass on the course, the student shall be able to:

- explain basic normal psychological mechanisms of importance for the patient-doctor relationship,
- at a general level account for the different components of patient communication,
- with correct nomenclature account for the anatomical and histological structure of organs in the thorax, abdomen and pelvis and their blood supply, innervation and position in relation to one another and to surface anatomic regions,
- account for the embryonic and fetal development of organs in the thorax, abdomen and pelvis and adaptations of the child in conjunction with childbirth,
- account for basic pharmacological concepts and principles in pharmacokinetics and pharmacodynamics,

- explain the electric activity of the heart, its function as pump and how this function is regulated and can be influenced pharmacologically,
- account for the functional anatomy and histology of the blood vessels, the lymphatic vessels and the lymphoid organs and for the principles of exchanges at the capillary level,
- explain how the blood flow in different organs can be changed and regulated and how vessel tone can be influenced pharmacologically,
- explain integrated blood pressure regulation and how blood pressure varies in different parts of the circulatory system,
- explain how the structure and cellular mechanisms of the kidney form the conditions for urine formation, how liquid and electrolyte balance are regulated and how the functions of the kidneys can be influenced pharmacologically,
- account for the functions of the urinary tract and how the micturition is regulated,
- account for the functions of the airways,
- explain the preconditions necessary for the creation of air flow in and out of the lungs, how the ventilation is regulated and the modes of action for bronchus-dilating pharmaceuticals,
- explain the pulmonary gas exchange, ventilation-perfusion conditions in the lungs and how gases are transported in the blood,
- account for the buffer system of the body and the interplay between respiration and the kidneys in acid-base regulation,
- account for the different components of the blood, their functions, production and renewal, and how hematopoiesis is regulated hormonally and can be affected by nutritional status,
- explain the endocrine and neuroendocrine control systems and principles of endocrinological pharmacology,
- account for how endocrine disorders can give rise to changes in energy, liquid, electrolyte, and acid/base balances and how these can be influenced pharmacologically,
- explain the functions in the digestive tract and the accessory organs that lead to uptake of nutrients, electrolytes and water and how these functions are regulated and can be influenced pharmacologically,
- account for the functions of the liver and the biliary tracts and their regulation,
- account for the functions of macronutrients and lipoproteins, their flow and storing during different nutritional statuses and how energy metabolism and appetite are regulated,
- account for the uptake, transport, storing and functions of micronutrients,
- identify deviations in a given diet in relation to the nutritional recommendations for healthy individuals,
- explain how body temperature is regulated,
- explain the function and regulation of the reproductive organs, the changes that take place at puberty and menopause, and mechanisms of different contraceptive methods,
- account for fertilisation, implantation and placentation and the interplay between hormones and changes in the woman's body during pregnancy and childbirth,
- account for the structure of the mammary glands and how the milk production and the milk ejection are regulated during the lactation,
- explain how aging influences the maintenance of the body's homeostasis,
- account for common methods that are used for physiological studies on humans and how the results are interpreted.

Competence and skills

For a Pass on the course, the student shall be able to:

- handle different conceptions in a collaborative situation in relation to a defined problem in the subject,
- analyse a work team's development process
- constructively contribute to trusting and productive group dynamics,
- in a simulated situation carry out the introduction to a conversation with a patient and their family with the application of professional methods to establish a trustful relationship and the imparting of relevant information,
- give feedback to a fellow student with respect to the initial part of the patient communication,
- carry out and interpret the physical examination of healthy individuals with regard to circulation, respiration and abdominal status,
- apply the most important parts of the Patient Act and the Health and Medical Services Act,
- discuss scientific methods and analytical methods, results and conclusions in relation to issues in research articles,
- describe ethical considerations in research studies,
- discuss a scientific controversy orally in English,
- search for research articles in two different medical databases in a structured way and based on basic search techniques.

Judgement and approach

For a Pass on the course, the student shall be able to:

- reflect on professional and empathetic approaches in the meeting with patients,
- identify their knowledge needs and evaluate their approach in both studies and clinical situations.

Course content

The course takes as its starting point the earlier courses in the Medical Programme regarding knowledge and abilities, as well as scientific and professional approach. The course focuses on integrative physiology, which means how the internal organ systems interact to maintain homeostasis. This includes the structure of the organ systems (anatomy, histology), function and regulation (physiology) and their embryonic development and aging. The course includes the following organs and organ systems: the heart, circulatory system and blood, kidneys and urinary tract, respiratory system, digestive tract with accessory glands, liver and biliary tract, endocrine organs and reproductive organs. Furthermore, integrated knowledge of energy metabolism and nutrition physiology is included. The course concerns how homeostasis is maintained at rest and under different conditions such as physical activity and potential changes that affect homeostasis in the surroundings. Physiological examination methods for example ECG, blood pressure measurement, spirometry, pulse oximetry and MRI, will be introduced. General pharmacological principles are treated and are supplemented by the modes of action for pharmaceutical groups that influence the above-mentioned organ systems.

The students develop on skills from previous courses with respect to reading, understanding, summarising, presenting and discussing scientific articles and searching for scientific literature.

The course includes clinical examination methodology concentrated on the heart, lungs, peripheral vessels, blood pressure and abdomen and gives an introduction to communication methodology with a general overview of the whole patient-doctor conversation with a focus on the patient's part. As additional help for the treatment of patients, an introduction is given to medical psychology, above all directed towards communication and understanding of normal psychological mechanisms. The course

prepares students for clinical work with legal and ethical questions and discussion of the formation and contents of the profession as a whole. The students have the opportunity to observe closely and reflection over this in conjunction with clinically integrated training.

Course design

The fundamental principle of the course is student-centred learning, in which the students take responsibility for their own knowledge development. To support the students' learning, the key knowledge content of the course is addressed through problem-based learning (PBL). The PBL components are also to help students to develop a scientific and professional approach. The clinically integrated training components are supplemented by other learning components such as lectures, group exercises, seminars, activities via learning platforms and laboratory sessions/practical exercises. There will also be elements of clinically-integrated learning in the health care departments of the Southern healthcare region.

The following are compulsory components: PBL components, clinically-integrated learning, group exercises that concern professional development and other group activities specified in the course portfolio. Subject to a special decision by the examiner, a compulsory component may be replaced by a written make-up assignment. The examiner determines whether a student has achieved the relevant learning outcomes for the compulsory component, which is documented in the course portfolio.

Assessment

Continuous and active participation in the compulsory PBL activities is a key element in the assessment of the course. The PBL activities are used to assess a basic professional approach and the ability to work constructively in groups. The PBL activities are therefore divided into two separate assessed components each worth 3 credits: "PBL - basic professional attitude" and "PBL - self-knowledge and constructive work in groups".

The component "PBL - Basic Professional Approach" (3 credits) is used to continuously assess the student's basic professional approach. The grade of Fail is given if the student demonstrates such serious deficiencies in the basic professional approach that this seriously counteracts the group's PBL activities. The grade of Fail can also be given if the student has a high non-attendance rate for PBL components.

If a student demonstrates such serious deficiencies in the basic professional approach that the group's PBL activities are counteracted or if the student has a high non-attendance rate for PBL components, the examiner is to issue a warning to the student. If, despite this, the deficiencies remain, the examiner can immediately discontinue a student's PBL activities. Discontinuation of PBL means that the student fails the component "PBL - Basic Professional Approach" and has used up one opportunity for PBL. An individual study plan is to be drawn up by the examiner and approved by the programme's student welfare committee. The individual study plan is to include an action plan that states what the student needs to do and demonstrate in order for the deficiencies to be considered rectified. The individual study plan is also to state details relating to the student's later readmission to studies. The examiner assesses whether the requirements of the action plan have been met and must approve it before the student can be readmitted to studies. If the student fails the component "PBL - Basic Professional Approach", they will not be permitted to participate in the course assessments, including the compulsory components, until

they have met the requirements of the action plan and the individual study plan.

"PBL - self-knowledge and constructive work in groups" (3 credits) assesses the objectives in the course syllabus that concerns these abilities and attitudes.

Knowledge gained in the course is assessed based on a written exam (15 credits). The exam is in the form of a multiple choice test, requiring the student to select the best answer. If the test is failed, it is to be retaken in full with the same exam design.

Anatomy and histology will be assessed at separate examination opportunities (3 credits each) where structures should be identified and provided with correct nomenclature.

The course portfolio (3 credits) documents completed compulsory components, written assignments and passed practical components including a pass on participation in clinically-integrated learning. The course portfolio also documents judgement and scientific and professional approach. The documentation is to include both oral and written components. The course portfolio is awarded the grade of Pass or Fail at the end of the course. In addition, a general assessment of the course portfolio is carried out at set intervals.

Decisions regarding the grade of Pass or Fail are made by the examiner.

The first opportunity for a student to participate in an examination is at the first regular opportunity after registering for the course.

Number of assessments of Problem-Based Learning (PBL):

Students who do not achieve a grade of Pass in the first PBL opportunity will have two more opportunities for assessment. The number of PBL opportunities is limited to three. A student who has failed PBL three times will have to discontinue their studies on the programme.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Subcourses that are part of this course can be found in an appendix at the end of this document.

Grades

Marking scale: Fail, Pass.

Entry requirements

Passed courses (all samples/modules) in Semester 1.

Passed grade on PBL - Basic Professional Attitude in the course Movement and Neuroscience (Semester 2).

Further information

Close-down of course

The course *Homeostasis* (LÄKC31) will be given for the last time in the spring term 2022. For students who have not passed examinations, the following possibilities to pass them are given:

Theoretical examination:

In total four examination opportunities will be offered after the course has ended. These examination opportunities are given alongside regular theoretical examination and re-examination of LÄKC32 *Homeostasis* HT22 and VT23.

Anatomy examination:

In total four examination opportunities will be offered after the course has ended. These examination opportunities are given alongside the morphology examination in LÄKC32 *Homeostasis* HT22 and VT23.

Histology examination:

In total four examination opportunities will be offered after the course has ended. These examination opportunities are given alongside the morphology examination in LÄKC32 *Homeostasis* HT22 and VT23.

PBL - Self-Knowledge and Constructive Work in Groups:

One PBL occasion is given a semester HT22-HT23 in the course LÄKC32. The student has the opportunity to supplement the examination in connection with one of these occasions. The number of occasions to carry out and be assessed on the PBL component is limited to three. The student may also obtain a Pass if they receive the grade Pass on an equivalent component in a higher semester since there is a progression in the intended course learning outcomes. This assumes that possible supplementary assignments for this course (LÄKC31) are completed and passed by the examiner.

PBL - Basic Professional Approach:

If the student obtains a Fail, an individual study plan should be created in accordance with the contents of the course syllabus. The examiner of LÄKC32 assesses whether the requirements of the action plan have been met and must approve it before the student can be readmitted to studies.

Course portfolio:

The course portfolio can be supplemented up to HT23. Contact the examiner for LÄKC32 *Homeostasis* for all parts/components.

The course LÄKC31 closes at end of term HT23. Thereafter, supplementary qualification is no longer possible.

Subcourses in LÄKC31, Homeostasis

Applies from H19

- 1901 Theoretical examination, 15,0 hp
Grading scale: Fail, Pass
- 1902 Anatomy Hearing, 3,0 hp
Grading scale: Fail, Pass
- 1903 Histology Hearing, 3,0 hp
Grading scale: Fail, Pass
- 1904 PBL - self-knowledge and constructive work in groups, 3,0 hp
Grading scale: Fail, Pass
- 1905 PBL - basic professional approach, 3,0 hp
Grading scale: Fail, Pass
- 1906 Portfolio, 3,0 hp
Grading scale: Fail, Pass