



**Karolinska  
Institutet**

Course syllabus for

## **The Healthy Human 3, 16.5 credits**

Den friska människan 3, 16.5 hp

This course has been cancelled, for further information see Transitional provisions in the last version of the syllabus.

Please note that the course syllabus is available in the following versions:

Autumn2008 , Autumn2009 , Spring2010 , Spring2011 , Spring2012 , Autumn2016 , Autumn2017 , Spring2020 , Spring2022 , Autumn2023

Course code	2LK009
Course name	The Healthy Human 3
Credits	16.5 credits
Form of Education	Higher Education, study regulation 2007
Main field of study	Medicine
Level	G1 - First cycle 1
Grading scale	Pass, Fail
Department	Department of Neuroscience
Participating institutions	<ul style="list-style-type: none"><li>• Department of Physiology and Pharmacology</li><li>• Department of Molecular Medicine and Surgery</li><li>• Department of Clinical Neuroscience</li></ul>
Decided by	Programnämnden för läkarprogrammet
Decision date	2007-03-13
Revised by	Programnämnden för läkarprogrammet
Last revision	2008-06-25
Course syllabus valid from	Autumn 2008

## **Specific entry requirements**

All credits from semester 1.

## **Objectives**

The aims relate to the general learning outcomes of the whole Study Programme in Medicine. The knowledge is tiered according to the SOLO taxonomy: S1) simple (e.g. know, identify), S2) compound (e.g. account for, describe), S3) related (e.g. analyse, relate), and S4) extended (e.g. theorise, analyse). The skills are structured according to Miller's pyramid: M1) know, M2) know how to carry out, M3) be able to show, and M4) be able to carry out professionally. After the course, the student should be able to relate the basic mechanisms of life to health and unhealth (S3). account for the structure and function

within the nervous system and senses at a molecular, cellular and organ system level (S3). account for how a changed morphology and function in the nervous system can lead to disease (S3). account for different ways to study the structure and function (S2) of the nervous system. account for basic anatomy and topographic anatomy concerning the head, the throat and the trunk, to be able to identify pathological changes (S2). Specific aims for the 2 parts of the course

**Part 1: The nervous system - from ion canal to behaviour**

**Knowledge and understanding** The student should be able to account for the entire chain of structures and the function of these structures from individual ion channels in the cell membranes to sensory, perceptive, motor, emotional and cognitive functions including behaviour (S2-3). describe basic behavioural psychological models both from an individual and from a group perspective (S3). connect behaviours to the function of the brain (S3). account for individual, age and gender related differences concerning the structure and function (S2) of the nervous system. account for how disorders in the function of the nervous system can be discovered and also be explained (S1). account for the scientific basis of the part and also have a good understanding of different scientific methods (S2). **Skills** The student should be able to identify the structures of the nervous system in anatomical preparations of histological preparations, in anatomic models and in radiological images (M3). account for the fundamental procedure in the function tests carried out in the laboratory sessions concerning vision, hearing, and the vestibular nerve, and neurological and cognitive functions (M2). identify psychological mechanisms that affect the behaviour of people in both everyday and clinical situations, and also be able to analyse these behaviours on the basis of different theoretical models (M4). identify the basic scientific cause of the patient's neurological symptoms (M1). show ability to work in groups, for example, in connection with laboratory sessions, dissections, microscopy and discussions (M2). both seek and compile information based on a medical question that is related to the course contents (M2). both account for and evaluate the contents of scientific articles (M3). both compile and present results of information retrieval in scientific databases (S2). **Attitude** The student should be able to sum up detailed knowledge of different functional subsystems in the nervous system to an overall picture of nervous system's structure and function (S3). know how knowledge of the nervous system has been obtained and be able to search as well as absorb scientific source material (S2). be able to reflect on their own behaviour based on psychological models and also be able to use this knowledge to achieve increased self-awareness (S3, M3). be able to describe problem behaviours in other individuals in a constructive, not judging way (S3, M3). be able to reflect on the importance of a scientific attitude in the medical activities (S2).

**Part 2: The body as a unit - surface anatomy and topography**

**Knowledge and understanding** The student should be able to categorise and analyse surface anatomic and topographic conditions in the head, on the throat and on the trunk, (S3). identify anatomic structures as they are reflected via different radiological methods (S2). account for differences both between the sexes, and between different ages with respect to anatomic structures (S2). Discover, and also be able to account for, pathological changes in the head, on the throat, and in the trunk, based on normal surface anatomic and topographic conditions (S2). be able to account for the scientific basis of the part and also have a good understanding of different scientific methods (S2). **Skills** The student should independently, but under some supervision, be able to show how to carry out some organ dissections (M3). palpatorily be able to identify basic anatomic structures and be able to grade how internal organs are projected on the surface of the body (M3). through his knowledge of surface anatomy, be able to account for how physical status is carried out and also be able to account for certain examination methodology, for example how ECG electrodes should be placed (M2). be able to show basic skills to assess physical status (M3). both be able to search and compile information based on a medical question that is related to the course contents (M2). both be able to account for and evaluate the contents of scientific articles (M3). both be able to compile and present results of information retrieval in scientific databases (S2). **Attitude** The student should be able to apply knowledge of morphology in clinical thinking (S3). develop an understanding of pathology, radiology, surgery and orthopaedics (S3). show an ethical approach to the dead body (S3, M3). identify and analyse work-related ethical issues and also be able to maintain ethical reasonings (S3, M3). reflect on the importance of a scientific attitude in the medical profession (S2).

## Content

Part 1: The Nervous System - from ion channel to behaviour (10.5 credits) (The Nervous system - from

ion channel to behaviour This part is divided into six sections with the participation of basic scientific, as well as clinical active teachers. The topic-specific core consists of neuroscience with the disciplines macro and microscopical neuro-anatomy, development neurobiology, cellular neurobiology, neurophysiology and medical psychology. Main contents The macroscopic and microscopic structure of the nervous system. The central and peripheral nervous systems. The macroscopic and microscopic development of the nervous system. Neurulation. Stem cells, neuronal differentiation, formation of neuronal circuits and synaptogenesis. Structural and functional aspects of individual nervous and support cells, and mechanisms for signal transduction in the nervous system. Various types of sensory systems and how they are integrated structurally and functionally. The brain treatment of sense information, so-called perception. The motor control system, integrated structurally and functionally. Planning, initiation and regulation of movements. Higher central nervous functions with a description of psychological mechanisms. Regulation of behaviours, wakefulness, sleep, emotion, attention and stress. Social interaction, disease behaviour, learning, memory, cognition and language. Integration During all subparts, basic science and clinic are integrated, so that clinical elements constitute at least 10% of the total contents of the part. This takes place through clinic-based lectures and through seminars with a patient case under supervision of clinical teachers, and at clinical teaching. In addition, professional and scientific development are integrated in this part. Function systems and examples of integrating assignments: Senses and the nervous system: Hearing impairment, sensory disorder, pain, vision disorder, dizziness, buzzing. Mental: Aggressiveness and irritability, dependency and abuse, depressivity, disorientation and turmoil, deteriorated intellect, learning and memory problems, personality disorder, stress and crisis reaction, sleep disorder, tiredness, anxiety and concern. Motion: Abnormal and unsteady gait, dyskinesia and tremor, trauma and injury. Part 2: The body as an entity - topography and surface anatomy (6 credits) (The body as an entity - topography and surface anatomy) Main contents The contents of the part are focused on the three-dimensional relations concerning internal organs, vessels and nerves in the head, on the throat and on the trunk, and how these structures are projected on the surface of the body, in order to provide a basis for a examination technique. palpable structures, in order to understand examination methods in different disease symptoms in the musculoskeletal system and in surface close organs. basic anatomic knowledge to facilitate interpretation of radiological studies. Integration During all subparts, basic science and clinic are integrated, so that clinical elements constitute at least 10% of the total contents of the part. This takes place through clinic-based lectures and through practical exercises in surface anatomy, led by clinicians and physiotherapists. Professional and scientific development is also integrated in this part. Function systems and examples of integrating assignments: Senses and the nervous system: Head-ache, hearing impairment, pain in the eye, pain in the ear, trabismus, pain in the face. Circulation: Heart murmurs, swelling in extremity. Hematopoiesis and the immune system: Enlarged lymph nodes, lump in the groin, lump on the throat. Respiration: Respiratory sounds, hoarseness, difficulty in respiration, nasal obstruction and rhinitis, pain in the throat. Digestion: Anorectal pain, blood in the faeces and discoloured faeces, abdomen pain, diarrhea, constipation, jaundice, resistance in the abdomen, swallowing disorders, changed faeces habits. Metabolism and the endocrine system: Lump in the breast. The urinary organs: Blood in urine, pain in urination, thick urethral strictures, urinary incontinence. Reproduction: Pain in the pelvis, swelling and pain in testicle and scrotum.

## **The Nervous system - from ion channel to behaviour, 10.5 hp**

Grading scale: GU

## **The body as an entity - topography and surface anatomy, 6.0 hp**

Grading scale: GU

## **Teaching methods**

During the course, general lectures are given. A considerable part of the teaching consists of problem-oriented supervised practice, e. g. workshops in neuro-anatomy and neurohistology, neurophysiological laboratory sessions, computer-based laboratory sessions, group assignments on

patient cases, seminars, dissections, and group assignments in practical surface anatomy.

## Examination

Part 1: The nervous system - from ion canal to behaviour During the different subparts of the part, oral group tests are carried out. These tests serve both as a support for, and control of, the student's knowledge acquisition, and as a forum to discuss, clarify and enhance the contents of the subpart. Compulsory attendance is required at workshops, tests and laboratory sessions. Make-up opportunities are provided during an on-going course. The part is completed with a written examination that contains a number of themes, where structure and function are integrated. Part 2: The body as a unit - surface anatomy and topography Compulsory parts consist of three self-evaluations, or web-based questions concerning throat, head, the chest cavity and the abdominal pelvis, respectively. The part is completed with a written examination and a practical test concerning surface anatomic and topographic knowledge. Overall aims of professional development The examination is arranged either through a portfolio or written home exam. The student is free to choose examination form. In case of an unsatisfactory examination, the student must supplement, according to instructions of the examiner. Limitation of number of examination or practical training sessions applies The number of examination and practical training sessions follows the local guidelines of Karolinska Institutet, implying that the number of examinations is limited to 6, while placement, as a rule, may be repeated only once.

## Transitional provisions

If a course has been closed down or undergone major changes, at least two additional examinations (excluding regular examinations) in the previous contents are provided during a period of a year from the date of the change.

## Other directives

Course evaluation takes place according to the guidelines established by the Board of Education. The examiner may with immediate effect interrupt a student's placement if the student demonstrates such serious deficiencies in knowledge, skills or attitudes that patient safety or patient confidence in healthcare is at risk. If the placement is interrupted, it implies that the student fails in the current part. In such cases, an individual action plan should be set up, where it comes clear which activities and examinations are required, before the student is given the possibility to further placement.

## Literature and other teaching aids

### Neuroscience

*Purves, Dale*

4th ed. : Sunderland, Mass. : Sinauer, cop. 2008 - 857 s. + (52 s.)

ISBN:978-0-87893-697-7 LIBRIS-ID:10531974

[Library search](#)

*Haines, Duane E.*

### Neuroanatomy : an atlas of structures, sections, and systems

6. ed. : Philadelphia, Pa. : Lippincott Williams & Wilkins, cop. 2004 - xii, 319 s.

ISBN:0-7817-4677-9 (hft.) LIBRIS-ID:9239606

[Library search](#)

*Myers, David G.*

### Psychology

8. ed. : New York : Worth Publishers, 2006, cop. 2007 - 778, [135] s.

ISBN:0-7167-7929-3 LIBRIS-ID:10338483

[Library search](#)

*Moore, Keith L.; Dalley, Arthur F.; Agur, Anne M. R.*

**Clinically oriented anatomy**

5. ed. : Philadelphia : Lippincott Williams & Wilkins, cop. 2006 - 1209 s.

ISBN:0-7817-3639-0 LIBRIS-ID:9800901

[Library search](#)

*Moore, Keith L.; Agur, Anne M. R.*

**Essential clinical anatomy**

3., [rev.] ed. : Philadelphia : Lippincott Williams & Wilkins, cop. 2007 - xx, 692 s.

ISBN:0-7817-6274-X LIBRIS-ID:10155388

[Library search](#)

*Snell, Richard S.; Snell, Richard S.t Clinical anatomy for medical students.*

**Clinical anatomy**

7. ed. : Philadelphia : Lippincott Williams & Wilkins, cop. 2004 - x, 1012 s.

ISBN:0-7817-4315-X LIBRIS-ID:9023138

[Library search](#)

*Sobotta, Johannes*

**Sobotta Atlas of human anatomy. Anatomy.**

*Putz, R.; Pabst, Reinhard*

12. English ed., nomenclature in Latin : Munich : Urban & Schwarzenberg, 1994 - 2 vol.

LIBRIS-ID:8225093