Faculty of Medicine

# LÄKC21, Movement and Neuroscience, 30 credits

*Rörelse och neurovetenskap, 30 högskolepoäng*

**First Cycle / Grundnivå**

## Details of approval

The syllabus  is an old version, approved by The Medical Degree Programme Board on 2018-09-19 and was last revised on 2018-09-19. . The revised syllabus applied from 2018-09-19.  , spring semester 2019.

## General Information

The course makes up semester 2 of the Master of Science programme in Medicine. The course is compulsory, like all other courses on the medical degree programme.

*Language of instruction:* Swedish
Literature and teaching in English may be included.

| *Main field of studies* | *Depth of study relative to the degree requirements* |
|---|---|
| Medicine | 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 students shall be able to

- account for the difference between issues of facts and values, and descriptive and normative ethics
- account for confidentiality legislation in healthcare
- explain the meaning of key ethical concepts, norms and principles that are used in Swedish healthcare
- describe, in overview, the rules of professional ethics and research ethics as well as the internationally adopted human rights
- account for the embryonic development of the nervous system

- use the correct terminology to account for the anatomical and functional structure of the nervous system, including different cell types and their properties
- explain the fundamental structure of nerve cells, and the electro-physiological and molecular mechanisms behind nerve cell signals
- explain the structural basis of muscle contractions, and their molecular mechanisms in striated muscles, as well as compare the function of different muscle types
- account for the vascular anatomy of the central nervous system (CNS), as well as the anatomy and functions of the ventricular system and meninges
- account for the regulation of the CNS's blood supply, liquid circulation and pressure conditions and how they can be influenced
- account for the cranial nerves including their nucleuses' fundamental division between motor, sensory, and autonomous functions as well as the cranial nerves' anatomical processes and functions
- account for the skull, as well as the structural and functional anatomy of the pharynx in terms of chewing, swallowing and speech function
- use the correct terminology to account for the anatomical structure of the musculoskeletal system including the whole skeleton with joints, muscles, circulation and innervation
- account for the physiology, structure and growth of bones, cartilage, and other support tissue
- account for the structure, growth, function and innervation or the skin
- account for the neuronal conditions for proprioception, pain and skin sensory mechanisms
- describe the structure of the cerebral cortex and its functional design
- account for the anatomy and function of key motor tracts
- account for the anatomy and function of the cerebellum, thalamus and basic ganglia as well as their interaction with other structures in the CNS and their role in motor control
- explain how movements are generated and controlled through interaction between the nervous system and different parts of the musculoskeletal system
- describe different reflex systems that are essential to the body's integrity and function
- account for the anatomy of the sensory organs and their histological structure as well as their functions including the anatomy and function of the most important sensory tracts from sensory organs to the cerebral cortex
- describe important CNS structures for speech generation and interpretation
- account for the neuronal basis for emotions, memory and learning
- describe the physiological bases of sleep, wakefulness and levels of awareness
- account for age-related changes in the nervous system, the musculoskeletal system and the sensory organs from a public health perspective

## Competence and skills

For a Pass on the course, the students shall be able to

- work in groups and constructively contribute to the group's formal work process
- give constructive feedback to fellow students and teaching staff regarding the group's development and work
- concisely document meetings in a small working group, with appropriate language and understanding of the content
- search for research articles in a medical database in a structured way and using basic search techniques
- identify and describe scientific and analytical methods as well as account for how choices of methods are justified by the issues addressed in scientific articles

- identify ethical considerations in research studies
- account for a scientific controversy in writing in Swedish
- conduct a basic physical examination and summarise the result with regard to the normal function of the nervous system and the musculoskeletal system and, in collaboration with people from other professions, identify a patient's functional limitations and propose possible measures

### Judgement and approach

For a Pass on the course, the students shall be able to

- describe their own development as active professionals
- identify opportunities for development of strategies for learning together with others based on common goals
- describe examples of possible ways to apply human rights in healthcare, focusing on preventing discrimination
- reflect on how their own values and the grounds of discrimination, as defined in the Discrimination Act, may influence the treatment of patients and staff in healthcare
- based on a patient perspective, reflect on health, disease and healthcare
- approach patients, their loved ones, staff and fellow students in a respectful way

## Course content

The course builds on Semester 1 with regard to scientific and professional approach as well as knowledge in cell biology particularly in terms of cell communication, embryonic development of different tissue types and their cellular formation and structure. The course covers the development, anatomy and histology of the musculoskeletal system and the nervous system, as well as the physiology of muscles, bones, cartilage and connective tissue. Furthermore, it includes the structure and physiological bases of the peripheral nervous systems (somatic, autonomous). It also deals with the descriptive and functional anatomy for the upper and lower extremities, the torso (including the neck), the skull and the central nervous system. This includes the vessels and nerves that supply/innervate the respective areas. During the course, the students are to use a simple light microscope and be able to identify different structures in tissues of relevance to the course. Basic physical examinations, focusing on the nervous system and the musculoskeletal system, are introduced.

The course covers the neurobiological/physiological conditions for hearing, balance, sight, smell, taste, the somatosensory system, sensorimotor control, higher functions, memory and learning, emotions, language, speech and consciousness.

The professional language of medicine is introduced (including Latin, Greek, Anglo-Saxon and Swedish terms).

The scientific approach is developed further through focus on reading, understanding, summarising, presenting and discussing scientific articles as well as searching for scientific literature.

The course covers basic medical ethics, human rights, equal opportunities and risks of discrimination (ethnicity, culture, religion, age, disability, socio-economic status,

gender, gender identity and expression, and sexual orientation) as well as Swedish confidentiality legislation. The course may also include interprofessional teaching components that highlight competencies of other healthcare professions with regard to the assessment of nervous system and musculoskeletal system diseases.

## 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 to enable students to develop a scientific and professional approach. Other learning components such as lectures, group exercises, seminars, activities via a learning platform and laboratory/practical exercises complement the PBL components. Furthermore, the course includes components of clinically integrated learning at institutions in the whole healthcare region of Southern Sweden.

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

## Assessment

Continuous and active participation in the compulsory PBL activities is a key element of 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 divided into two separate assessed components of 3 credits each: "PBL- Basic Professional Approach", and "PBL- Self-Understanding and Constructive Work in Groups".

The component "PBL- Basic Professional Approach", is used to assess the outcomes in the course syllabus covering these abilities and approaches. The examiner may with immediate effect interrupt a student's PBL activities if the student shows such serious deficiencies in the basic professional approach as to seriously counteract the group's PBL activities, or if the student does not demonstrate the basic professional approach that surrounds PBL activities. Such a measure must be preceded by a warning from the examiner to the student. When PBL activities are interrupted in this way the student will be awarded a grade of Fail for the component and have used up one opportunity for PBL activities. If a student is awarded a grade of Fail for this component an individual study plan is to be drawn up. If the student is awarded a grade of Fail for the component "PBL- Basic Professional Approach", he or she may not participate in the examinations of the course.

The component "PBL- Self-Understanding and Constructive Work in Groups" is used to assess the outcomes in the course syllabus covering these abilities and approaches.

The knowledge content of the course is assessed through a written exam (15 credits). The exam is in the form of a multiple choice test, requiring the student to select the best answer. A failed test is to be retaken in full with the same exam design.

Completed compulsory components, self-administred tests, written assignments, passed practical components including approved participation in clinically integrated learning are to be documented in a course portfolio (9 credits), . The course portfolio is also used to document judgement and scientific and professional approach. The documentation is to include both oral and written components.

The examiner decides on grading.

Students who have registered for the course are able to participate in the first regular exam session.

Number of assessments of Problem-Based Learning (PBL):
Students who do not achieve a Pass at the first training opportunity will have two more opportunities for assessment. The number of opportunities for assessment of PBL 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

To be admitted to the course, students must have passed *PBL- Basic Professional Approach* in the course *Molecule to Tissue* in semester 1.

## Subcourses in LÄKC21, Movement and Neuroscience

Applies from V19

1901 Theory Exam, 15,0 hp
Grading scale: Fail, Pass
1902 PBL – basic professional approach, 3,0 hp
Grading scale: Fail, Pass
1903 PBL – Self-Knowledge and Constructive Group Work, 3,0 hp
Grading scale: Fail, Pass
1904 Portfolio, 9,0 hp
Grading scale: Fail, Pass