

Principles in Physiology

Programme course

6 credits

Fysiologiska principer

NBIB29

Valid from: 2017 Spring semester

Determined by

Board of Studies for Chemistry, Biology
and Biotechnology

Date determined

2017-01-25

Main field of study

Biology, Biotechnology, Chemical Biology

Course level

First cycle

Advancement level

G1X

Course offered for

- Biology, Bachelor's Programme
- Chemical Biology, Bachelor's Programme

Specific information

This course cannot be included in the same degree as the course NBIB45.

Entry requirements

Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites

Cellbiology or equivalent.

Intended learning outcomes

After the course is completed the student should be able to:

- show knowledge about (human) physiology and to be able to describe:
 - the structure and function of a neuron, the organization and function of the nervous system
 - the structure and function of sensory receptors and sensory organs
 - the structure and function of muscle-cells, striated muscle, heart muscle and smooth muscle
 - the anatomy of the heart, blood-vessels and circulatory system. Show knowledge about the function of the heart and circulatory system and regulation of bloodpressure.
 - the anatomy and function and regulation of the respiratory system.
 - the organization and function of the endocrine system, hormone-synthesis and examples of how hormones regulates function of the organism
 - the anatomy and function of the kidney, its roll in regulating blood-pressure, salt-balance and water-balance
- acquire practical laboratory skills in basic physiology
- be able to describe lab-results and physiological functions in lab-reports
- be able to interpret lab-results and connect them with the theory presented in course litterature
- be able to solve problems in physiology as a group
- be able to, individually, identify and describe a physiological principle
- be able to compare physiological functions in humans with other animals

Course content

Physiological function at an organ and organsystem-level:

- Nervous system
- Sensory physiology
- Endocrine system
- Muscles
- Circulation/Blood
- Respiration
- Excretion

Assignment:

Problem solving in physiology as a group. Each student identifies a physiological principle (listed below) important to the problem solved.

Physiological principles:

- Negative feedback regulation
- Positive feedback regulation
- Conservation of mass and mass balances
- Pressure-flow relationships
- Diffusion
- Molecular flows and gradients
- Pressure-volume relationships in elastic tissues
- Cell to cell communication
- Transport of electrical charges
- Dissociation constants and chemical equilibrium

Practical laborations:

- Nervous system/Sensory physiology: Laboratory group work. Lab report. Tutor available.
- Computer laborations. Lab report. Independent group work.

Teaching and working methods

Lectures and practical lab-studies.

Examination

UPG1	Assignment	1 credits	U, G
LAB3	Approved laboratory course	1 credits	U, G
TEN2	Written examination	4 credits	U, 3, 4, 5

Grades

Four-grade scale, LiU, U, 3, 4, 5

Department

Institutionen för fysik, kemi och biologi

Director of Studies or equivalent

Agneta Johansson

Examiner

Eva Mattsson

Course website and other links

<http://www.ifm.liu.se/edu/coursescms/NBIB29/>

Education components

Preliminary scheduled hours: 45 h

Recommended self-study hours: 115 h

Course literature

Additional literature

Books

Silverthorn, D.U., *Human Physiology: An integrated approach* 7th ed. Pearson
ISBN: 1292094931

Other

Additional documents from LISAM.

Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at http://stydokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.