Principles in Physiology and Ethics

Programme course

6 credits

Fysiologiska principer och etik

NBIB45

Valid from: 2017 Spring semester

Determined by
Board of Studies for Chemistry, Biology and Biotechnology

Date determined
2017-01-25

Offered for the last time
Autumn semester 2024

Replaced by
NBIB54

Main field of study
Biology, Biotechnology, Engineering Biology, Chemical Biology

Course level
First cycle

Advancement level
G1F

Course offered for
- Industrial Engineering and Management - International, M Sc in Engineering
- Chemical Biology, M Sc in Engineering
- Engineering Biology, M Sc in Engineering
- Industrial Engineering and Management, M Sc in Engineering

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
- describe and use basic ethical theories, principles and concepts to analyze ethical problems in natural sciences and technology.
- explain the importance of professional responsibility.

Course content

Physiological function at an organ and organsystem-level:
- Nervous system
- Sensory physiology
- Endocrine system
- Muscles
- Circulation/Blood
- Respiration
- Exctretion

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
- Massbalance

Ethical principles:
- Scientific integrity
- Ethical principles and concepts

Teaching and working methods

Lectures and seminars.

Examination

UPG1	Approved group assignments	2 credits	U, G
TEN1	Written examination	4 credits	U, 3, 4, 5

UPG1: For the grade "Pass", active participation is required at all seminars and a complete written assignment in ethics.

Grades

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

Other information

Supplementary courses: Animal Function and Environmental Adaptation

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: 40 h
Recommended self-study hours: 120 h

Course literature

Additional literature

Books

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

Other

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://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.