SK2530 Introduktion till bio-medicin 6,0 hp

Introduction to Biomedicine

Fastställande

Betygsskala

A, B, C, D, E, FX, F

Utbildningsnivå

Avancerad nivå

Huvudområden

Teknisk fysik, Bioteknik

Särskild behörighet

Undervisningsspråk

Undervisningsspråk anges i kurstillfällesinformationen i kurs- och programkatalogen.

Lärandemål

The overall aim of the course is to give an introduction to biomedicine to students with background in physics, interested in the interdisciplinary field between physics, biology and medicine.

After the course the student should be able to:

- describe the structure of the human body at the level of integrative systems, organs and tissues, and at the cellular and molecular level
- recognize the major processes and structural constituents in the basis for neuronal signaling, respiration, immune defence, energy generation, regulation of acid-base and water-salt balance
- identify the major processes and structures involved in the transport within the animal cells
- classify the major driving forces for transport of various substances between the cells and extracellular space
- describe the processes that enable cells to reproduce themselves
- understand the major processes that allow the organism to function as a whole (neuronal signaling, immune defense, hormone action)
- in their future professional practice, successfully communicate with colleagues that have a biological background
- recognize the biological objects and processes that are discussed in the following courses within the program of biological physics (for example, plasma membrane, a phospholipid, an ion transporter, intracellular signaling, DNA, a motor protein etc)

Kursinnehåll

Anatomy (3 hours): Main structures and features of the human body (systems, organs, tissues).

Physiology (13 hours): Basic principles of the human body functions, covering the nervous system, respiration, digestion, immune and endocrine system, acid-base homeostasis, water and salt balance.

Cellular and molecular biology (12 hours): The structural components of the cells. Basic principles of cellular functions: transport, metabolism, signaling, reproduction. The main molecules that mediate these processes.

Kurslitteratur

1. Matt M., Ziemian J., Human Anatomy Coloring Book, Dover Publ.

2. Despopoulos A., Silbernagl S., Color Atlas of Physiology, Thieme.

3. Alberts B.et al., Essential Cell Biology, Garland Science.

(The editions used will be announced on the course homepage at least four weeks prior to start of the course).

Examination

• TEN1 - Tentamen, 6,0 hp, betygsskala: A, B, C, D, E, FX, F

Examinator beslutar, baserat på rekommendation från KTH:s handläggare av stöd till studenter med funktionsnedsättning, om eventuell anpassad examination för studenter med dokumenterad, varaktig funktionsnedsättning.

Examinator får medge annan examinationsform vid omexamination av enstaka studenter.

När kurs inte längre ges har student möjlighet att examineras under ytterligare två läsår.

Övriga krav för slutbetyg

The course is examined by a five-hour written exam (TEN1; 6 university credits, grading A/B/C/D/E/Fx/F).

Etiskt förhållningssätt

- Vid grupparbete har alla i gruppen ansvar för gruppens arbete.
- Vid examination ska varje student ärligt redovisa hjälp som erhållits och källor som använts.
- Vid muntlig examination ska varje student kunna redogöra för hela uppgiften och hela lösningen.