



**Karolinska
Institutet**

Course syllabus for

Chemistry of the human body, 7.5 credits

Människokroppens kemi, 7.5 hp

This course syllabus is valid from autumn 2013.

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

Autumn2007 , Autumn2008 , Autumn2009 , Autumn2011 , Autumn2013 , Spring2015

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|----------------------------|---|
| Course code | 2TL007 |
| Course name | Chemistry of the human body |
| Credits | 7.5 credits |
| Form of Education | Higher Education, study regulation 2007 |
| Main field of study | Not applicable |
| Level | GX - First cycle |
| Grading scale | Pass, Fail |
| Department | Department of Medical Biochemistry and Biophysics |
| Decided by | Programnämnden för tandläkarprogrammet |
| Decision date | 2007-05-14 |
| Revised by | Programme Committee 10 |
| Last revision | 2013-08-15 |
| Course syllabus valid from | Autumn 2013 |

Specific entry requirements

Standardised admission requirements E.1.

Objectives

Knowledge and understanding are described at a general level in the following expected learning outcomes. The student should, in writing as well as orally, be able to account for: how molecules are built-up and understand their structural formulas. contents and distribution of the water solutions of the human body (the intracellular and extracellular fluids). the properties of acids and bases, and how buffers function. the fundamental features in the structure of the molecules of the cell and the basic intermediary metabolism. how nutrients are handled in the digestive tract. some of the functions of the blood. the inorganic and organic chemistry of the saliva, the biochemical reactions in a plaque and the chemistry of the hard dental tissues.

Content

The course starts with an overview/repetition of definitions and general concepts. This comprises: the

structure of atoms and molecules including the different forms of chemical bonds. Different ways to state concentration will be repeated/described. Strong emphasis is placed on acid-base equilibria and buffer systems. In this context, the water solutions of the human body, their contents of buffer components and other dissolved substances are described. The major part of the course is devoted to medical chemistry and includes: chemical structure and function for carbohydrates, lipids, proteins and nucleic acids; enzymology; digestion and absorption of different substance groups in the digestive tract; metabolism of carbohydrates, lipids, amino acids; the energy production in the cell; signal transduction; effects of some central hormones on metabolism and calcium flux; transport of oxygen and carbon dioxide in blood; plasma proteins; hemostasis. Integrated with the above contents, oral biochemistry is taught (biochemistry specific to the oral cavity). In this part, the inorganic and organic chemistry of the saliva with an emphasis on its ability to protect the oral cavity (inorganic ions, glycoproteins, pH buffering), the chemistry of hard dental tissues with an emphasis on biological calcium-phosphates, and the biochemistry of the plaque are included.

Teaching methods

To achieve the learning outcomes, the teaching is given in several different forms. Lectures dominate, but seminars, individual studies with teacher assistance, laboratory sessions and computer exercises are also included. Laboratory sessions with laboratory follow-up. The first laboratory lecture when safety in the course laboratory is reviewed, and the self-evaluations are compulsory. Missed occasions should be compensated for by a make-up assignment given by the course manager. The self-evaluations are good as a preparation for examination. Teaching in English can occur.

Examination

Examination is carried out through a written test. It is also required that compulsory parts of the course are passed (see above, instruction). Limitation of the number of examination occasions: If the student's examination has not passed, the student gets 2 more examination opportunities. After that, the student is recommended to retake the course and is given 3 more examination opportunities. If the student has not passed after 6 trials, the student will not be given another admission to the course (HF chapter 6 11a §).

Transitional provisions

If the course is closed down or goes through larger changes, the student is offered examination according to earlier literature list and expected learning outcomes under no more than one academic year after implemented close-down or revision.

Other directives

Course evaluation is carried out according to the guidelines established by the Board of education. The course substitutes TLOA52

Literature and other teaching aids

Rådmark och Wetterholm

Kompendium: Syror och baser. : Vattenlösningars egenskaper, osmos och tonicitet, elektrolyter
2008

Ferrier, Denise R.

Biochemistry

6. ed. : Lippincott Williams and Wilkins, 2013

ISBN:978-1-4511-7562-2 LIBRIS-ID:13993817

[Library search](#)

Erlanson-Albertsson, Charlotte; Gullberg, Urban

Cellbiologi

2., [rev. och uppdaterade] uppl. : Lund : Studentlitteratur, 2007 - 350 s.

ISBN:978-91-44-04738-6 LIBRIS-ID:10532220

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