



**Karolinska  
Institutet**

Course syllabus for

## **The Healthy Human 1, 24 credits**

Den friska människan 1, 24 hp

This course has been cancelled, for further information see Transitional provisions in the last version of the syllabus.

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

[Autumn2007](#) , [Autumn2008](#) , [Spring2009](#) , [Autumn2009](#) , [Spring2010](#) , [Autumn2010](#) , [Spring2011](#) , [Autumn2011](#) , [Autumn2012](#) , [Spring2013](#) , [Autumn2013](#) , [Spring2014](#) , [Autumn2014](#) , [Spring2015](#) , [Autumn2015](#)

|                            |   |
|----------------------------|---|
| Course code                | 2LK000  |
| Course name                | The Healthy Human 1                               |
| Credits                    | 24 credits  |
| Form of Education          | Higher Education, study regulation 2007           |
| Main field of study        | Medicine  |
| Level                      | G1 - First cycle 1                                |
| Grading scale              | Pass, Fail  |
| Department                 | Department of Medical Biochemistry and Biophysics |
| Decided by                 | Programnämnden för Läkarprogrammet                |
| Decision date              | 2007-03-13  |
| Revised by                 | Programnämnden för läkarprogrammet                |
| Last revision              | 2008-06-25  |
| Course syllabus valid from | Autumn 2008                                       |

## **Specific entry requirements**

Standardised admission requirements E.1.

## **Objectives**

The knowledge is tiered according to the SOLO taxonomy: S1) simple (e.g. know, identify), S2) compound (e.g. account for, describe), S3) related (e.g. analyse, relate), and S4) extended (e.g. theorise, analyse). The practical skills are tiered according to Miller's pyramid: M1) know, M2) know how to carry out, M3) be able to show, and M4) be able to carry out professionally. The learning outcomes of the course are divided in learning outcomes for the respective parts of the course. The aims of scientific development are integrated with the aims of the parts. Part 1: Development - from egg to embryo Knowledge and understanding The system of man, in balance The student should know basic anatomic terminology and, in adults, be able to account for the structure and function of the organ systems at a general level, especially concerning circulation and respiratory organs, the urinary organs, the nervous system and the endocrine organs (S2). be able to account for the microscopic structure of the cell and its

most important functions and for the structure and function of the different cell organelles (S2). be familiar with basic genetic terminology, be able to account for the organisation of the genome and its development at cellular, chromosomal and gene levels, and be able to explain the basic molecular genetic mechanisms in relation to the structures and functions of the cells (S3). be able to account for the molecular mechanisms of developmental biology, for the development of the cells in the most important tissue types, for the turnover of the cells, and for the individual's development, from the formation of germ cells to embryo, and also be able to account for all this in relation to heredity and environment (S2). be able to account for cell growth, cell specialisation, cell motion and interactions between cells, and be able to explain how the interactions facilitate the development of a multicellular organism (S3). for both simple and complex genetic diseases, be able to discuss the relationship between heredity and environment on the one hand and phenotype on the other (S4). The system of man, in balance The student should be able to account for various mutation types, for factors causing mutations and for mechanisms used by the cell to maintain genomic integrity (S2). Skills The human system, directly and indirect contact The student should be able to use concept maps in order to analyse, make aware of and learn complex relationships around basic cell biological mechanisms, as well as around the different function systems of the body (M2). collect and analyse basic scientific as well as clinical issues and be able to summarise the result in writing (M2). Attitude Knowledge and attitude The student should be able to demonstrate insights into how man's phenotype is the results of the interaction between individual heredity and development in a complex and varying environment (S1). Part 2: Digestion and metabolism Knowledge and understanding The system of man, in balance and in imbalance The student should be able to account for the chemical building blocks of the cell (S1-S2). the structure and function of the digestive tract, and also be able to relate this knowledge to how different nutrients are digested and absorbed (S1-S3). the metabolism of carbohydrates, lipids, proteins and nucleotides and also be able to relate this knowledge to various metabolic conditions as well as to various diseases (S1-S3). the structure and function of the liver, and of the relation of the liver to the digestive tract, and also be able to relate this knowledge to different symptoms and diseases (S1-S3). both pancreas structure and function, and for pancreas the relation to the digestive tract, and to the metabolism, and be able to relate this knowledge to various symptoms and diseases (S1-S3). the importance of macro and micro nutrients for the body functions and maintenance of health and to understand what the nutritional recommendations are based on (S1-S3). Skills Indirect contact The student should be able to take capillary blood samples, be able to carry out peroral glucose load and be able to analyse lactates, blood lipids and enzymes (M1 - M2). protect oneself against infection as well as against damage in handling blood and chemicals (M1 - M2). collect and analyse information on both basic scientific and clinical issues and be able to present the results (M2). use microscopy (M3). be able to demonstrate anatomical structures in dissected organs, in plastic models and in radiological images, and be able to identify tissues in histological preparations (M2). be able to work in a mixed group and present, together with the group, jointly obtained results (M1). Attitude The student should through an analytical attitude, be able to understand the mechanisms of origin of diseases (S3). be able to show respect for the dead body (S3). Aims for professional development Knowledge/understanding The student should be able to define the central ethical concepts that are involved in the course (S2) define the basic concepts in medical psychology treated during the course (S2) account for professional ethical rules and for different ethical systems that are of relevance to medical ethics (S2) Skills The student should be able to identify ethical problems and also be able to analyse and argue rationally about them (M3). distinguish psychological issues (M2) be able to conduct a talk with patients in a patient-centered way (M2) Attitudes The student should be able to respond to both patients and family, and colleagues and others concerned in a respectful way and also be able to reflect on different interests at stake (S2, M2).

## Content

The course is organised in two main parts, and a final part that consists of integrating and summarising elements, and a written final examination. Professional development (PD) and scientific development (VetU) are integrated in the course. The primary care constitutes one of many arenas where the teaching is carried out under DFM1. Part 1: Development - from egg to embryo, 6 credits (Development - from egg to embryo) The part, that is based on human development from germ cells to embryo, give an introduction to the most important functions and structures of the cell and to embryology, and to the

molecular mechanisms of developmental biology. The initial sub-part of the part gives an introduction to the structure and function of the organ systems of the adult individual, and to anatomic terminology. The part comprises the circulation and respiratory organs, the urinary organs, the nervous system and the endocrine organs. Further, basic functions are discussed, at molecular and cellular levels with a special focus on mechanisms enabling a multicellular organism to develop i.e. growth and heredity, interactions between cells, cell motion, cell transport and cell specialisation. The knowledge is enhanced in basic scientific and clinical lectures, during group discussions, in teaching sessions, through modelling and via the production of models and concept maps. In a scientific project specialise the student in the genetics mechanisms under the theme Heredity and man in health and un-health. The topic-specific core of the part consists of the basic scientific disciplines cell and molecular biology and developmental biology. During this part, the function systems metabolism and the endocrine system, reproduction, movement, skin, and development and aging, are treated. The teaching of professional development is given in seminars, with a focus on group dynamic theories which the student may also apply in practical situations in groups, where basic knowledge in consultation and nursing methodology is both provided and practiced. A part of the teaching is located to the primary care. Part 2: Digestion and metabolism, 12 credits (Digestion and Metabolism) The part treats, in an integrated way, the structure and function of the digestive tract at a molecular, subcellular, cellular, tissue and organ level. the organisation and regulation of chemical life processes. the structure and function of molecules and cells. nutrition physiological aspects and the relation to common national diseases. The topic-specific core of the part consists of the basic scientific disciplines macroscopic and microscopic anatomy, medical biochemistry, physiology and endocrinology. This part treats the function systems digestion, metabolism and the endocrine system, circulation, hematopoiesis and the immune system. The link between clinic and pathology takes place primarily with regard to the metabolic syndrome, that is, between diabetes and hyperlipidemia on the one hand and atherosclerosis, obesity and hypertension on the other. The connection, however, is also made to disturbances in the digestive tract. The knowledge is enhanced both via clinic lectures, and, in some cases, via meetings with patients. The scientific core of the part consists of laboratory sessions, which are examined in writing. The core also includes to be able to handle calculating programs, to analyse basic scientific articles and to analyse bases for e. g. diets and diet recommendations. The teaching of professional development is given as lectures, seminars and group exercises, where ethics and medical psychology are applied and consultation skills are trained. Part 3 - Integration with a final examination, 6 credits The final parts of the course include integrating lectures, self-study and question sessions, and a final examination of the basic scientific core of parts 1 and 2. Integration between clinic and basic science In the course, the following function systems are treated, illustrated by the listed integrating assignments: Digestion: Bloody vomiting, blood in/dicoloured faeces, abdominal pain, abdominal swelling, diarrhea, constipation, jaundice, heartburn/sour eructations, vomitings/inappetence/nausea, resistance in abdomen, swallowing disorders, changed faeces habits, eating disorders. Metabolism and the endocrine system: Lump in the breast, weight loss, weight gain/overweight, increased thirst. Circulation: High blood pressure, swelling in extremity, oedemas. Hematopoiesis and the immune system: Paleness, hemorrhagic disorder. Reproduction: Pregnancy, infertility/sexual dysfunction. Motion: Dyskinesia, weakness. Skin: Wounds. Development and aging: Dying patient, abnormality, deviant growth, deviant motor development. The clinical teaching is to a great extent integrated with the basic scientific teaching. The teaching is given within the primary care.

## **Development - from egg to embryo, 6.0 hp**

Grading scale: GU

## **Digestion and Metabolism, 12.0 hp**

Grading scale: GU

## **Integration and exam, 6.0 hp**

Grading scale: GU

## Teaching methods

**Part 1: Development - from egg to embryo** In the elements with systematic anatomy, the main working methods are lectures and group assignments. The molecular and cellular basic mechanisms of life, as well as developmental biology, are high-lighted with both basic scientific and clinical lectures with teaching sessions and discussions, through modelling and through the production of concept maps where important concepts are compared and related. The scientific project comprises information retrieval, self-study, discussions and to write an essay. Professional development is taught both through lectures and group tuition that is based on experience-based learning. **Part 2: Digestion and metabolism** The part comprises both theoretical and practical teaching in the form of lectures, patient examples from the clinic and project work, where larger problems are treated. A part of the teaching takes place in the form of self-study with teacher support. The course also includes, laboratory sessions under supervision and demonstration of anatomical and histological preparations. The teaching of professional development is conducted in groups, by means of experience-based learning. The exercises in consultation and nursing methodology take place under supervision. **Part 3: Integration with final examination** The final parts of the course include summarising lectures, reflection, self-study and question sessions, and a final integrating examination. The course overlaps in time partly with the course the Beginning and PD and VetU-parts related to the Beginning take place during the course.

## Examination

**Part 1: Development - from egg to embryo** The part is examined both with self-evaluations, and with oral, written or IT-based tests. The scientific project work is examined individually with an essay. The concept maps are presented both orally and in writing and with a modelling. The part professional development, that is seminars with a focus on group dynamics, and the teaching in consultation and nursing methodology are compulsory. The teaching that is carried out in the primary care has compulsory attendance. The aims of professional development are examined through reflecting portfolio sheets. **Part 2: Digestion and metabolism** Reviews and lectures on safety have compulsory attendance, as well as laboratory sessions and all placement. The part is examined both with compulsory self-evaluations, and with oral, written or IT-supported tests. The laboratory sessions are examined through group reports. Project works are examined in groups through oral presentations. **Part 3: Integration with final examination** For participation in the written examination, approved compulsory tests under Part 1 and Part 2 are required. The final examination that is in writing covers knowledge from the simple to the more advanced levels. The student is hereby given the possibility to relate, compare, analyse and discuss different phenomena. A part of the examination is based on scientific publications. The aims of professional development are examined through reflecting portfolio sheets. Compensation of absence from, and participation in, compulsory subparts: For tests, quiz, laboratory sessions, safety lectures, safety sessions, presentations of project works, and in the teaching of professional development and in the primary care, compulsory attendance applies. Compensation of absence takes place according to the examiner's instructions, or where appropriate according to instructions of the PU coordinator or of the supervisor in the primary care. If the portfolio is unsatisfactory, the student must make-up according to instructions of the PU coordinator. **Limited number of examinations or practical training sessions** The number of examination and practical training sessions follows the local guidelines of Karolinska Institutet, implying that the number of examinations is limited to 6, while placement, as a rule, may be repeated only once.

## Transitional provisions

If a course has been closed down or undergone major changes, at least two additional examinations (excluding regular examinations) in the previous contents are provided during a period of a year from the date of the change.

## Other directives

Course evaluation is carried out according to guidelines that are established by the board of education. The examiner may with immediate effect interrupt a student's placement if the student demonstrates such serious deficiencies in knowledge, skills or attitudes that patient safety or patient confidence in healthcare is at risk. If the placement is interrupted, it implies that the student fails in the current part. In such cases, an individual action plan should be set up, where it comes clear which activities and examinations are required, before the student is given the possibility to further placement.

## Literature and other teaching aids

*Champe, Pamela C.; Harvey, Richard A.; Ferrier, Denise R.*

### Biochemistry

4. ed. : Baltimore, MD : Lippincott Williams & Wilkins, cop. 2008 - 528 s.

ISBN:978-0-7817-6960-0 (hft.) LIBRIS-ID:10531981

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*Berg, Jeremy Mark; Tymoczko, John L.; Stryer, Lubert*

### Biochemistry

6. ed. : New York, N.Y. : Freeman, cop. 2007 - xxxv, 1026, [86] s.

ISBN:0-7167-8724-5 (inb.) LIBRIS-ID:10124283

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*Devlin, Thomas M.*

### Textbook of biochemistry : with clinical correlations

5. ed. : New York : Wiley-Liss, cop. 2002 - xxiv, 1216 s.

ISBN:0-471-41136-1 LIBRIS-ID:4973780

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*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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*För både momentet Professionell utveckling och Preklinisk tentamen används litteratur från tidigare genomgånga kurser inom psykologprogrammet.*

### Laurells Klinisk kemi i praktisk medicin

*Nilsson-Ehle, Peter; Ganrot, Per Olof; Laurell, Carl-Bertil*

8., [rev. och utök.] uppl. /b Peter Nilsson-Ehle (red.) ; redaktionskommitté: Per Olof Ganrot ... : Lund : Studentlitteratur, 2003 - 723 s.

ISBN:91-44-00766-3 (inb.) LIBRIS-ID:9153885

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### Medical biochemistry

*Baynes, John W.; Dominiczak, Marek H.*

2., [rev.] ed. : Philadelphia, Pa. : Elsevier Mosby, 2005 - xii, 693 s.

ISBN:0-7234-3341-0 LIBRIS-ID:9756430

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*Nelson, David Lee; Cox, Michael M.; Lehninger, Albert*

### Lehninger principles of biochemistry

5th ed. : New York : W. H. Freeman ;a Basingstoke :b Palgrave [distributor], cop. 2008. - 1158 s.

ISBN:978-0-7167-7108-1 LIBRIS-ID:10718150

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*Feneis, Heinz; Dauber, Wolfgang*

**Anatomisk bildordbok**

*Spitzer, Gerhard; Brinkman, Ingrid*

5., utökade uppl. /b [fackgranskning: Håkan Aldskogius] : Stockholm : Liber, 2006 - [4], 520 s.

ISBN:91-47-05301-1 LIBRIS-ID:10162715

URL: <http://www2.liber.se/bilder/omslag/100/4705301o.jpg>

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*Moore, Keith L.; Dalley, Arthur F.; Agur, Anne M. R.*

**Clinically oriented anatomy**

5. ed. : Philadelphia : Lippincott Williams & Wilkins, cop. 2006 - 1209 s.

ISBN:0-7817-3639-0 LIBRIS-ID:9800901

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*Moore, Keith L.; Agur, Anne M. R.*

**Essential clinical anatomy**

3., [rev.] ed. : Philadelphia : Lippincott Williams & Wilkins, cop. 2007 - xx, 692 s.

ISBN:0-7817-6274-X LIBRIS-ID:10155388

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*Snell, Richard S.; Snell, Richard S.t Clinical anatomy for medical students.*

**Clinical anatomy**

7. ed. : Philadelphia : Lippincott Williams & Wilkins, cop. 2004 - x, 1012 s.

ISBN:0-7817-4315-X LIBRIS-ID:9023138

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*Boron, Walter F.*

**Medical physiology : a cellular and molecular approach**

*Boulpaep, Emile L.*

Updated ed. : Oxford : Elsevier, cop. 2005 - 1319 s.

ISBN:1-4160-2328-3 (hbk.) LIBRIS-ID:9836552

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*Guyton, Arthur C.; Hall, John E.*

**Textbook of medical physiology**

11. ed. [rev.] : Philadelphia : Elsevier Saunders, cop. 2006 - xxxv, 1116 s.

ISBN:0-7216-0240-1 LIBRIS-ID:9893191

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*Despopoulos, Agamemnon; Silbernagl, Stefan*

**Color atlas of physiology**

5. ed., completely revised and expanded : Stuttgart : Thieme, cop. 2003 - 436 s.

ISBN:3-13-545005-8 (Stuttgart) LIBRIS-ID:8865758

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*Ross, Michael H.*

**Histology : a text and atlas**

*Pawlina, Wojciech*

5. ed. : Philadelphia, Pa. : Lippincott Williams & Wilkins, cop. 2006 - 906 s.  
ISBN:0-7817-5056-3 LIBRIS-ID:9974719

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*Alberts, Bruce*

### **Molecular biology of the cell**

5. ed. : New York : Taylor & Francis, cop. 2008 - xxxiii, 1268 s.  
ISBN:9780815341062 (paperback) LIBRIS-ID:10645719

URL: <http://www.loc.gov/catdir/toc/ecip0710/2007005475.html>

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*Mitchell, Barry; Sharma, Ram*

### **Embryology**

*Britton, Robert*

Edinburgh : Elsevier Churchill Livingstone, 2005 - vii, 81 s.  
ISBN:0-443-07398-8 LIBRIS-ID:9503791

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### **Nordic Nutrition Recommendations 2004 : integrating nutrition and physical activity**

4th edition : Copenhagen : Nordic Council of Ministers, Council of Ministers,c 2004 - 435, [1] s.  
ISBN:92-893-1062-6 LIBRIS-ID:9851293

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