Course syllabus for

Integrated Physiology and Pharmacology, 25 credits

Integrerad fysiologi och farmakologi, 25 hp
This course syllabus is valid from autumn 2024.
Please note that the course syllabus is available in the following versions:
Autumn2022 , Autumn2024

Course code	4FF000
Course name	Integrated Physiology and Pharmacology
Credits	25 credits
Form of Education	Higher Education, study regulation 2007
Main field of study	Translational Physiology and Pharmacology
Level	AV - Second cycle
Grading scale	Pass with distinction, Pass, Fail
Department	Department of Physiology and Pharmacology
Decided by	Education committee FyFa
Decision date	2021-10-11
Revised by	Education committee FyFa
Last revision	2024-03-05
Course syllabus valid from	Autumn 2024

Specific entry requirements

A Bachelor's degree or a professional degree worth at least 180 credits in biomedicine, biotechnology, cellular and molecular biology, pharmaceutics, health care, medicine, or the equivalent. Proficiency in English equivalent to the Swedish upper secondary school course English 6/English B.

Objectives

The aim of the course is for the student to gain an integrated understanding of the subjects physiology and pharmacology and an overall understanding of how the body functions, what happens in the body during disease and how the body is influenced by different factors including pharmacologically active substances. Through knowledge in the main field, the aim is furthermore that the student should learn practical aspects and understand how physiological and pharmacological principles can be applied and integrate these subjects as well as understand translational pre-clinical and/or clinical research.

After completing the course, the student should be able to:

- Explain physiological principles and how the organ systems of the healthy human body functions and interacts during normal conditions
- Explain principles in pharmacokinetics, pharmacogenetics, pharmacodynamics and receptor pharmacology
- Integrate knowledge in physiology and pharmacology
- Describe the complexity in organ system-related diseases and pharmacological or non-pharmacological treatment of these diseases
- Account for how pharmacological methods and lifestyle changes can be used for prevention and treatment of diseases
- Account for the use of bioinformatics and health informatics in physiology and pharmacology
- Search for and evaluate relevant research articles in translational physiology and pharmacology
- Critically review and evaluate current research in translational physiology and pharmacology
- Define the concept of sustainable development and compare challenges to achieve the global goals in different countries

Content

The course includes integrated physiology and pharmacology at the molecular, cellular and integrative level, as well as pharmacological principles. All teaching is based on the functions of the organs during 1. normal/healthy conditions, 2. abnormal conditions/diseases, and 3. pharmacological/non-pharmacological treatment to create an integrated understanding of the subject areas.

The global health perspective and integration of prevention, diagnostics, pharmacological methods and lifestyle changes will be discussed during the course.

The course is divided in the following parts:

Introduction to physiology and pharmacology, 6.0 hp

Grading scale: VU

This part contains:

- Physiology and pharmacology at the molecular, cellular and integrative level
- Pharmacokinetics, pharmacogenetics, pharmacodynamics and receptor pharmacology

Respiration, circulation, endocrinology, digestion, kidney function and movement, 10.0 hp

Grading scale: VU

This part contains:

- Physiology, pathophysiology and pharmacology in: heart, circulation, respiration, kidney and fluid balance, the gastrointestinal tract, the liver, endocrinology and reproduction, and the musculoskeletal system
- Applied Physiology

Nervous system and immune system, 6.0 hp

Grading scale: VU

This part contains:

- Neurophysiology, neuropathology and neuropharmacology

- The immune system, inflammation and anti-inflammatory treatment
- Infectious Diseases; principles, prevention and treatment
- Cancer and cancer treatment

From hypothesis to therapy, 3.0 hp

Grading scale: GU

This part contains:

- General principles of drug development
- Bioinformatics and health informatics in a physiological and pharmacological context
- Integration of prevention, pharmacological methods and life style changes
- Integration of how to bring an experimental hypothesis to drug development and treatment

Teaching methods

Orientating lectures, team-based learning (TBL), workshops, seminars, practical labs and journal clubs.

Examination

Part 1: Introduction to physiology and pharmacology, 6.0 credits.
Examinations:
Written examination (exam). Graded Fail/Pass/Pass with distinction.
Written assignment Graded Fail/Pass.
Oral presentation of the assignment. Graded Fail/Pass.

Part 2: Respiration, circulation, endocrinology, digestion, kidney function and movement, 10.0 credits.
Examinations:
Written assignments Graded Fail/Pass/Pass with distinction.
Oral presentation of assignments. Graded Fail/Pass.

Part 3: The nervous system and the immune system, 6,0 credits
Examinations:
Written assignment Graded Fail/Pass/Pass with distinction.
Oral presentation of assignment. Graded Fail/Pass.

Part 4: From hypothesis to treatment, 3,0 credits
Examinations:
Written assignment Graded Fail/Pass.
Oral presentation of assignment. Graded Fail/Pass.

Written assignments should be submitted before the end of the course according to the specification in the schedule. To pass the course (the grade Pass or higher), at least passed on all components of the course is required. To pass the course with distinction, the grade Pass with distinction on the parts "Respiration, circulation, endocrinology, digestion, kidney function and movement" and "the Nervous system and the immune system" is required.

Compulsory participation
Participation in Team-based learning and journal clubs is compulsory. The examiner assesses if, and how, absence from compulsory course elements can be made up for. Study results cannot be reported until the student has participated in compulsory course elements or compensated for any absence in accordance with instructions from the examiner. Absence from a compulsory course element could mean that the student can not retake the element until the next time the course is offered.

Limitation of number of tests or practical training sessions
The students that have not passed after regular examination session have the right to participate at

further five examination sessions. If the student has carried out six failed examinations/tests, no additional examination or new course admission is approved.

Each occasion the student participates in the same test counts as an examination. Submission of a blank exam paper is regarded as an examination. In case a student is registered for an examination but does not attend, this is not regarded as an examination.

In the event of special circumstances, or if a student with a disability is in need of certain adjustments, the examiner may decide to depart from the syllabus' regulations on examination form, number of examination opportunities, possibility of completion or exemption from compulsory educational elements, etc. Content and intended learning outcomes as well as the level of expected skills, knowledge and abilities must not be altered, removed or lowered.

Other directives

The course is given in English, and the examinations are in English.

A course evaluation will be carried out in accordance with the guidelines established by the Board of Higher Education.

Oral evaluation, course council, will take place during the course.

Literature and other teaching aids

Mandatory literature

Medical physiology

Boron, Walter F.; Boulpaep, Emile L.

Third edition. : Philadelphia, PA : Elsevier, [2016] - xii, 1297 pages

ISBN:9781455743773 LIBRIS-ID:19496717

Or later edition.

Library search

Rang and Dale's Pharmacology

Ritter, James; Flower, R. J.; Henderson, Graeme; Loke, Yoon Kong; Rang, Humphrey Peter; Dale, M. Maureen

Ninth edition : Amsterdam : Elsevier, 2019 - 789 pages

ISBN:9780702074486 LIBRIS-ID:bl06m44b809mw1mz

Or later edition.

Library search

Additional study materials and reference articles will be provided during the course