

VMFN32, Human Toxicology: From Exposure to Disease, 7.5 credits

Humantoxikologi: Från exponering till sjukdom, 7,5 högskolepoäng
Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by The Master's Programmes Board on 2021-02-03 to be valid from 2021-02-04, autumn semester 2021.

General Information

This is a freestanding second cycle course intended for those who are interested in human toxicology.

Language of instruction: English

Main field of studies

Medicine

Depth of study relative to the degree requirements

A1N, Second cycle, has only first-cycle course/s as entry requirements

Learning outcomes

Knowledge and understanding

On completion of the course, the students should be able to:

- explain how different substances (chemicals, metals, toxins, particles) can cause toxic effects and diseases in humans
- define basic toxicokinetic concepts and doses, and explain their importance in the determination of toxicity
- explain how humankind contributes to discharges of toxic substances and how these affect our health
- explain how genetics and epigenetics can affect sensitivity to toxic substances
- explain how health-related environmental monitoring/biomonitoring functions
- explain how epidemiological studies are used to evaluate human exposure to toxic substances and the risk of disease

Competence and skills

On completion of the course, the students should be able to:

- calculate basic toxicokinetic profiles and doses of toxic substances
- carry out basic risk assessment of toxic substances
- identify biomarkers in urine/blood in exposure to toxic substances through chemical analysis
- search, identify and evaluate research literature in toxicology
- present a research plan, orally and in writing, in the field of toxicology

Judgement and approach

On completion of the course, the students should be able to:

- identify and evaluate ethical issues in connection with the collection of samples for the analysis of biomarkers
- reflect on the social relevance of research about different environmental factors and toxic substances

Course content

The aim of the course is to provide an overview of human toxicology that links exposure to toxic substances in the environment to diseases. The concept of toxicology will be introduced by describing how toxic substances (chemicals, metals, toxins, particles) in our daily life can affect the health of people. Routes of exposure will be linked to certain diseases (e.g. inhaling of chemicals and airway diseases). Toxicokinetics, dose response and routes of exposure will be discussed as well as genetic and epigenetic mechanisms. The students will also learn how climate change can affect exposure to toxic substances and reflect on relevant ethical and societal issues. Research articles based on both epidemiological studies and clinical investigations will be discussed as well as risk assessments, environmental monitoring programmes and regulations. The course includes a laboratory session in which the students carry out chemical analysis of biomarkers for exposure in urine/blood.

Course design

The teaching consists of lectures, group exercises, a laboratory session and written assignments. The sessions will be conducted by lecturers from different research domains. Articles and online study resources are distributed throughout the course. The students will work on an individual project during the course to enable specialisation in a specific theme within environmental health that has been chosen by each student.

Compulsory attendance is required at the laboratory session and all group exercises.

Assessment

The course is examined through two assessed components:

- Course portfolio (3 credits): the assessed component includes a written and oral presentation of a research plan, oral presentation in groups and active

- participation in the laboratory session and other compulsory components
- Written exam (4.5 credits)

If there are special reasons, other forms of examination may apply.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Subcourses that are part of this course can be found in an appendix at the end of this document.

Grades

Marking scale: Fail, Pass.

For a grade of Pass, the student must attain a grade of Pass on all assessed components and participate in compulsory components

Entry requirements

English 6/the English B and 120 first or second cycle credits, of which at least 15 credits in chemistry or biology.

Subcourses in VMFN32, Human Toxicology: From Exposure to Disease

Applies from H21

- 2101 Course portfolio, 3,0 hp
Grading scale: Fail, Pass
- 2102 Written exam, 4,5 hp
Grading scale: Fail, Pass