Exchange programme Vrije Universiteit Amsterdam

Vrije Universiteit Amsterdam - Exchange programme Vrije Universiteit Amsterdam - 2024-2025

Exchange

Vrije Universiteit Amsterdam offers many English-taught courses in a variety of subjects, ranging from arts & culture and social sciences, neurosciences and computer science, to economics and business administration.

The International Office is responsible for course approval and course registration for exchange students. For details about course registration, requirements, credits, semesters and so on, please visit the exchange programmes webpages.

Toxicology

Course Code	AB_1277
Credits	6
Period	P2
Course Level	300
Language Of Tuition	English
Faculty	Faculty of Science
Course Coordinator	dr. S.L. Hughes
Examiner	dr. S.L. Hughes
Teaching Staff	prof. dr. M.B.M. van Duursen, dr. M. Margalef Jornet MSc, dr. S.L. Hughes, dr. ir. T.H.M. Hamers, dr. R.T. Molenhuis, dr. L.A. Baumann
Teaching method(s)	Practical, Lecture, Study Group

Course Objective

The aim of this course is to introduce students into the scientific field of toxicology. At the end of this course students are able to:

1. Explain the mode of action for the toxic chemicals addressed in this course, from exposure to adverse health outcome
2. Interpret results from toxicity studies reported in literature and understand how these results fit in the adverse outcome pathway
3. Identify knowledge gaps in the adverse outcome pathways and suggest a particular type of toxicity study to fill these gaps
4. Construct a dose-response curve and use it for hazard characterization purposes
5. Apply quantitative toxicity data for risk assessment purposes according to the toxicological paradigm of Paracelsus

Course Content

This course addresses exposure, effects, and risk assessment of toxic chemicals. In the “exposure” part, we will mainly focus on routes of exposure, on human biomonitoring, and toxicokinetics. Next, we will discuss toxic effects at different levels of biological organization, ranging from the molecular initiating event (MIE) via key events (KE) at the cellular and organ levels to the adverse outcome (AO) at a population level, within the framework of Adverse Outcome Pathways (AOPs). Different levels of toxicity testing will be covered ranging from in silico and in vitro studies to in vivo animal studies and epidemiological studies. Finally, the course will address how quantitative toxicity data are used in risk assessment procedures to derive threshold doses for toxic compounds to which we are exposed through different routes of exposure (food, drinking water, air, soil, house dust, consumer goods, working place, etc.).

Throughout the course the effect of different compounds will be studied, including pharmaceuticals, pesticides, mutagenic compounds, metals, and industrial chemicals, with a focus on endocrine disrupting chemicals.

All subjects above will be taught in lectures. Special attention will be given to AOP construction and testing strategies in working groups. In addition, students will work in pairs and be assigned a chemical compound. Students will test their compound in a practical for its capacity to start a molecular initiating event and/or cause an adverse outcome. Based on information about the MIE, the AO and what is described about the toxicity of the compound in the literature, the students will write an AOP-based summary about the toxicity of their compound in the form of a Wikipedia page.

Additional Information Teaching Methods

Lectures 20x1h
Working groups 5x2h
Practical 2x4h
Self-study 130h

Method of Assessment

Written assignment (20%)
Multiple choice exam (80%)

Compensation: for each part of the examination the student should have a minimum grade of 5.5.

Literature

Will be announced later.

Additional Information Target Audience

3rd year Bachelor students Biomedical Sciences, the course is part of the minor Topics in Biomedical Sciences.

Additional Information

Maximum number of 64 participants.

Literature will be announced on CANVAS before the course starts.

Custom Course Registration

VUweb

Explanation Canvas

Literature will be announced on CANVAS before the course starts.