UCLouvain

lbrte2201

2019

Human and environmental toxicology

In view of the health context linked to the spread of the coronavirus, the methods of organisation and evaluation of the learning units could be adapted in different situations; these possible new methods have been - or will be - communicated by the teachers to the students.

5 credits	37.5 h + 7.5 h	Q1

Teacher(s)	Debier Cathy (coordinator) ;Hantson Philippe ;
Language :	English
Place of the course	Louvain-la-Neuve
Main themes	Human Toxicology (30h): Historical Overview, concepts and basic concepts in toxicology, assessment methods - Metabolism of xenobiotics : absorption by inhalation, ingestion or dermal; distribution; biotransformation (phase I and II reactions) and excretion - Toxicity of major pollutants or contaminants dangerous to humans: lead, cadmium, mercury, pesticides, dioxins, PCBs, air pollutants, carcinogens - Risk assessment. Environmental Toxicology (15h +7.5 h): Transport of pollutants - Monitoring of pollutants (biomarkers and bioindicators) - Emerging Pollutants - Contamination of foodstuffs - Endocrine Disruptors - Effects of pollutants on populations and communities - Risk assessment in ecotoxicology Depending on their program, students may attend only the "Human Toxicology" (BRTE2201A)
Aims	1 a. Contribution of the activity to the referential of the programme (LO) 1.1, 1.2, 2.2, 2.5, 6.1, 6.2, 6.4, 7.1, 7.3, 7.4, 8.1, 8.4, 8.5, 8.6 b. Specific formulation of the learning outcome of this activity. At the end of this course, the student: - knows and understands the basic principles of toxicology (dose, exposure, hazard, danger, indicator, biomarker) ; - is able to describe the epidemiological and experimental methods used to assess the toxicity of chemicals ; - knows the main routes of absorption, metabolism and elimination of toxic substances ; - is able to compare the toxicity of major pollutants and contaminants to which humans may be exposed according to their lifestyle (heavy metals, air pollutants, pesticides, dioxins, industrial pollutants, hydrocarbons ') After the section " Environmental Toxicology ", the student : - knows and understands the modes of contamination of the environment; - is able to describe the technical monitoring of pollutants in the environment (eg through the use of bio-indicators); - knows and understands the impact of pollutants on individuals (including humans) , communities and ecosystems (among others through the use of biomarkers); - masters the techniques of " risk assessment " in ecotoxicology; - understands the specificities related to the toxicity of endocrine disruptors and is able to make comparisons with other toxic substances; - knows emerging pollutants, including their toxic effects, and is able to compare it with older pollutants; - demonstrates critical thinking towards the impact of human activities on environmental contamination and ultimately on human health. - - - - *The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".*
Evaluation methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** Written exam during the session (questions on theory and exercices)
Teaching methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** Coordinated package of lectures with audio-visual aids (slides and videos) given by the teachers - concrete examples Exercices on risk assessment in ecotoxicology and seminars given by invited experts Most of the activity requires the presence of the students.
Content	The course is divided in different chapters : 1 - Principles of Toxicology

	- Introduction to toxicology - Characteristics of exposure - Interactions of chemicals - Dose-response - Variation in toxic responses 2 – Absorption, Distribution and Excretion of toxicants 3 – Biotransformation of Xenobiotics 4 – Heavy metals 5 - Pesticides 6 - Poisonous gases 7 - Persistent organic pollutants 8 - Plastics and microplastics 9 - Endocrine disruptors 10 - Environmental Toxicology - Transport and fate of toxicants in the environment - Environmental monitoring - Environmental risk assessment The practical section includes seminars given by experts and exercises on risk assessment in ecotoxicology
Inline resources	Moodle
Bibliography	Slides used by the professors are available on Moodle
Other infos	This course can be given in English.
Faculty or entity in charge	AGRO

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Chemistry and Bioindustries	BIRC2M	4		
Master [120] in Biomedical Engineering	GBIO2M	5		
Master [120] in Agricultural Bioengineering	BIRA2M	4		
Master [60] in Environmental Science and Management	ENVI2M1	5		
Interdisciplinary Advanced Master in Science and Management of the Environment and Sustainable Development	ENVI2MC	5		
Master [120] in Biochemistry and Molecular and Cell Biology	BBMC2M	5		
Master [120] in Environmental Science and Management	ENVI2M	5		
Master [120] in Environmental Bioengineering	BIRE2M	4		