

5.0 credits

45.0 h + 7.5 h

1q

Teacher(s) :	Bernard Alfred ; Debier Cathy (coordinator) ;
Language :	Français
Place of the course	Louvain-la-Neuve
Inline resources:	Icampus
Prerequisites :	Basics of chemistry, biochemistry and physiology
Main themes :	<p>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.</p> <p>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</p> <p>Depending on their program, students may attend only the "Human Toxicology" (BRT2201A)</p>
Aims :	<p>a. Contribution of the activity to the referential of the programme (LO)</p> <p>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</p> <p>b. Specific formulation of the learning outcome of this activity. At the end of this course, the student:</p> <ul style="list-style-type: none"> - 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 ') <p>After the section " Environmental Toxicology ", the student :</p> <ul style="list-style-type: none"> - 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. <p><i>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".</i></p>
Evaluation methods :	Oral or written exam

Teaching methods :	Lectures with audio-visual aids (slides and videos) - concrete examples - specific involvement of external experts
Content :	<p>Human Toxicology (30h) - After an introduction on the history of poisons and the concepts and basic principles of toxicology, the course describes the pathways and mechanisms involved in the absorption, distribution, biotransformation and excretion of xenobiotics. It then discusses the main toxic substances to which humans may be exposed in their living or professional activities: irritating and suffocating gas, heavy metals (lead, cadmium, mercury), pesticides, dioxins, hydrocarbons, asbestos, etc. Finally, it also addresses the methodology for risk assessment of chemicals.</p> <p>Environmental Toxicology (15h +7.5 h) - Each chapter of the course focuses on a specific topic related to environmental pollutants. The course covers the transport of pollutants in the biosphere and the accumulation profiles within organisms. Impacts of pollutants on individuals are also studied, from the biochemical level to the population. The concepts of bioindicator and biomarker are detailed. Topical issues such as the contamination of food, the effects of endocrine disruptors, especially during early exposure (gestation and lactation) and issues raised by emerging pollutants are discussed in detail.</p> <p>The practical section includes seminars given by experts, exercises on risk assessment in ecotoxicology and laboratory tour.</p>
Cycle and year of study :	<p>> Master [60] in Biology > Master [120] in Agricultural Bioengineering > Master [120] in Environmental Bioengineering > Master [120] in Environmental Science and Management > Master [120] in Chemistry and Bio-industries > Master [120] in Biochemistry and Molecular and Cell Biology > Master [120] in Biomedical Engineering > Master [60] in Environmental Science and Management</p>
Faculty or entity in charge:	AGRO