


7.00 credits

45.0 h + 30.0 h

Q2

Teacher(s)	Agnan Yannick ;Gerin Patrick (coordinator) ;Kruyts Nathalie ;
Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	.Background (bachelor level) in chemistry, physics and biology.
Main themes	The course aims at providing the students with a broad, multidisciplinary scientific background to approach environmental pollution and management problems (causes, consequences, remedies, influences of management practices). The objective of the course is to introduce students to a scientifically rigorous and critical approach of environmental problems and remediation solutions.
Learning outcomes	<p>At the end of this learning unit, the student is able to :</p> <p>At the end of this course, the student has acquired general knowledge in the field of environmental pollution. More specifically, facing a case study, (s)he is able to:</p> <ul style="list-style-type: none"> - Properly use the parameters (variables) and the units that characterize the environmental pollution; - Describe, explain and predict the behaviour of the various forms of pollution in environmental systems or technological remediation processes, with the proper identification of the processes involved, based on their knowledge of the concerned physical, chemical or biological principles; <p>1 - Select or rank remediation technologies according to their relevance to the nature of the pollution.</p> <p>After the seminar, the student is able to:</p> <ul style="list-style-type: none"> - Check the validity and relevance of claims in the environmental field, after seeking relevant scientific and technical arguments; - Exploit and organize the pros and cons arguments, to take and defend his own position with respect to these claims; - Communicate synthetically his position, both orally and in writing.
Evaluation methods	<ul style="list-style-type: none"> • Written examination according to the learning outcomes. • Oral presentation and written report on the personal essay (as student teams). <p>Weights: Written exam 75%, assignments [seminar + laboratory]: 25%</p> <p>To ensure a sufficient balance in the control of the different pollution domains covered by the course, the following conditions are imposed:</p> <ul style="list-style-type: none"> • The examination mark will be the geometric mean of the marks obtained for the examination of each of the 3 main parts of the course (in simplified formulation: "Air", "Soil", "Water") • The student must have reached at least 67% on the exam for his/her seminar and laboratory work grade to be taken into account. If this is not taken into account, their evaluation will be used only for training purposes.
Teaching methods	<ul style="list-style-type: none"> • Lectures, seminars by the students. • Personal work of analysis of general, scientific or technical documents, oral presentation and defence, and report writing on the personal work (as team). • External tour for sampling in the field and laboratory analysis the samples
Content	<p>Lectures</p> <p>1. Water pollution:</p> <ul style="list-style-type: none"> • Sources, mechanisms and symptoms of pollution in running water and lakes • Influence of pollution on living beings: oxygenation and deoxygenation, eutrophication • Measurement of water quality • Wastewater treatment • Prevention of water pollution <p>2. Air pollution:</p> <ul style="list-style-type: none"> • Terrestrial atmosphere • Sources of air pollution • Transfer and evolution of air pollutants • Outdoor air pollution • Indoor air pollution

	<p>3. Acoustic pollution:</p> <ul style="list-style-type: none"> • Introduction and definitions • Physical and psychophysiological characteristics of sound • Auditory and non-auditory effects of noise on living beings • Noise reduction means <p>4. Radioactive pollution:</p> <ul style="list-style-type: none"> • Introduction and definitions • Transfer of pollutants into the environment <p>5. Soil pollution:</p> <ul style="list-style-type: none"> • Introduction to pedology • Mineral pollution (example of metals) : sources, effects, transfer • Organic pollution (example of pesticides) : sources, effects, transfer • Soil pollutant remediation <p>6. Solid wastes:</p> <ul style="list-style-type: none"> • Characterization and collection of solid wastes • Selective collection • Treatment methods applied to urban waste: controlled landfill, composting, sorting, recycling • Issue of recycling <p>7. Electromagnetic pollution</p> <ul style="list-style-type: none"> • Basics • Impact of electromagnetic waves and light <p>Seminars presented by professional actors are associated with the program whenever possible.</p> <p>Student seminar</p> <p>In groups, students investigate and develop the critical analysis of claims disseminated to the general public on a practical problem in pollution and environmental management. They present their arguments in synthetic oral and written summary of communication.</p> <p>Laboratory and practice</p> <p>The laboratory activity is an introduction to the practical aspects of the characterization of pollution, based on field collection of water samples, laboratory analysis and interpretation of results.</p> <p>Visits of sewage or waste treatment plants or polluted sites are organized when possible.</p>
<p>Bibliography</p>	<p>Supports de cours et documents de référence disponibles sur Moodle.</p> <p>Livres utiles mais non obligatoires :</p> <p>Claus Bliefert & Robert Perraud (2009). <i>Chimie de l'environnement: Air, eau, sols, déchets</i>. De Boeck. ISBN: 9782804159450. pp. 478.</p> <p>Colin Baird & Michael Cann (2016). <i>Chimie de l'environnement</i>. De Boeck. ISBN: 9782804192174. pp. 776.</p> <p>Ces livres sont plus larges que la matière vue au cours et la présentent de manière différente, mais est un bon document de base, généraliste, pour un futur professionnel de l'environnement. Disponible à la BST.</p>
<p>Other infos</p>	<p>Teaching team of Professors with different backgrounds. Invited speakers when possible.</p>
<p>Faculty or entity in charge</p>	<p>ENVI</p>

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Interdisciplinary Advanced Master in Science and Management of the Environment and Sustainable Development	ENVI2MC	7		
Master [120] in Environmental Science and Management	ENVI2M	7		