

3.0 credits	30.0 h + 7.5 h	2q
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Teacher(s) :	Halen Henri ; Rollin Xavier (coordinator) ;
Language :	Français
Place of the course	Louvain-la-Neuve
Main themes :	<p>The main topics are:</p> <ul style="list-style-type: none"> <li>- Legal context of soil and water protection.</li> <li>- Causes, mechanisms and consequences of deterioration of soil and water.</li> <li>- Standards of water and soil quality, in relation to their scientific basis.</li> <li>- Selection of physico-chemical, biological, hydromorphological diagnostic criteria to assess water and soil quality.</li> <li>- Design of permanent monitoring programs for water and soil.</li> <li>- Technologies for decontamination of water and soil.</li> <li>- Case studies in anthropised or contaminated rivers, lakes, reservoirs, soil and groundwater.</li> </ul>
Aims :	<p>Knowledge:</p> <ul style="list-style-type: none"> <li>- Introduction to the legal framework with respect to water and soil quality.</li> <li>- Knowledge of the main physical, chemical and biological factors of soil and water pollution, of the mechanisms by which they affect the receiving environments, their effects on these environments, and their role in defining standards for water and soil quality.</li> <li>- Knowledge of the parameters that characterize the quality of water and soil, and analysis methods.</li> <li>- Introduction to the decontamination technologies for aquatic habitats or polluted soil</li> </ul> <p>Know-how and skills:</p> <ul style="list-style-type: none"> <li>- Ability to assess water and soil quality on the basis of their physico-chemical and biological characteristics, to diagnose the causes of deterioration, to determine the effects of these deteriorations and to propose technologies to protect or remediate the considered environments.</li> </ul> <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>
Content :	<p>After an overview of the European and Walloon legislative context specific to the continuous monitoring of water and soil, the course analyses the causes of deterioration of water and soil quality on the basis of the physical, chemical and biological processes that are involved. The third part of the course presents the methods for characterizing physical, chemical and biological parameters of water and soil that are connected to quality standards applicable to natural habitats according to their suitability for various uses: food production, household, agricultural or industrial use. The fourth part of the course assesses the effects of soil and water deterioration at different levels of organization and time scales. Various ecotoxicology concepts are outlined (sentinel species, bio-indicators for accumulation or effects ...) as well as the main methods of biocenose analysis used in Europe. The value of physiological, molecular and behavioral biomarkers as alarm systems against disturbances undetectable by biotic indices will be addressed. The fifth part of the course addresses the problem of designing networks to monitor water and soil quality, and integrating biological and physical-chemical parameters within these networks. Finally, the sixth part provides an overview of physico-chemical and biological processes and technologies that can be used for the decontamination of water and soil.</p>
Other infos :	<p>Reference books:</p> <ul style="list-style-type: none"> <li>- Bartram J. and Ballance R. (eds), 1996. Water Quality Monitoring. Chapman &amp; Hall, 384 p.</li> <li>- Chapman D. (ed.), 1996. Water Quality Assessments. Chapman &amp; Hall, 626 p.</li> </ul>
Cycle and year of study :	<p>&gt; <a href="#">Master [120] in Agricultural Bioengineering</a>                  &gt; <a href="#">Master [120] in Environmental Bioengineering</a>                  &gt; <a href="#">Master [120] in Forests and Natural Areas Engineering</a>                  &gt; <a href="#">Master [120] in Environmental Science and Management</a>                  &gt; <a href="#">Master [120] in Biology of Organisms and Ecology</a></p>
Faculty or entity in charge:	AGRO