





4.00 credits

22.5 h + 22.5 h

Q2

Teacher(s)	Biielders Charles ;
Language :	English > French-friendly
Place of the course	Louvain-la-Neuve
Prerequisites	Spreadsheet management (ExcelTM,') Basic use of Geographical information system) Basic knowledge in soil science
Main themes	<ul style="list-style-type: none"> <li>- Water, wind and tillage erosion : physical processes and quantification</li> <li>- Modeling of water erosion at plot and watershed scale</li> <li>- Principles of soil conservation in temperate and tropical environments</li> <li>- Soil conservation techniques and practices : physical, agronomical, vegetative, and management practices</li> </ul>
Learning outcomes	<p><b>At the end of this learning unit, the student is able to :</b></p> <ul style="list-style-type: none"> <li>a. Contribution de l'activité au référentiel AA (AA du programme) M2.2 ; M2.3 ; M2.4 ; M2.5 ; M4.1 ; M4.2 ; M4.5 ; M4.7 ; M5.3 ; M5.8 ; M6.5 ; M6.6 ; M6.7 ; M6.8</li> <li>b. Formulation spécifique pour cette activité des AA du programme Soil conservation (3.5 ECTS) At the end of the course and practicals, the students:                             <ul style="list-style-type: none"> <li>- Will master the main mechanisms involved in the degradation of soil by water , wind and tillage erosion;</li> <li>- Will be able to propose a methodology on an experimental basis to quantify land degradation by water erosion at the plot scale or watershed ;</li> <li>1 - Will be able to implement a simple model of water erosion in a GIS to assess the risk of erosion at the scale of the plot or watershed ;</li> <li>- Will master the principles of soil conservation and will be able to propose practices, technologies or devices adapted to the socio-economic and technical context of operators and aiming at reducing erosion at the plot and watershed scale;</li> <li>- Be able to communicate the results and conclusions of the simulations and experiments in the form of tables, graphs and scientific diagrams in a written report reflecting mastery of software tools essential for effective professional communication.</li> <li>- be able to position himself with respect to the management of soil erosion and muddy floods</li> </ul> </li> </ul>
Evaluation methods	Soil conservation <ul style="list-style-type: none"> <li>- 3 oral questions with written preparation (45 min) (40%)</li> <li>- Evaluation of practicals, based on written report (40%)</li> <li>- Participation in the role play (20%)</li> </ul>
Teaching methods	<ul style="list-style-type: none"> <li>- The lectures are given in English, but always illustrated by transparencies in French.</li> <li>- Reference book in English.</li> <li>- Practical work in the computer room lead the student to operational use of the RUSLE model.</li> <li>- Practical work in the laboratory (grass strip, wind erosion)</li> <li>- Exercise sessions (tillage erosion)</li> <li>- The practicals, to be carried out in a team, and report writing stimulate collective work and the development of skills related to professional communication;</li> <li>- Role play regarding the management of soil erosion for a fictitious site</li> </ul>
Content	Lectures <ul style="list-style-type: none"> <li>- Definitions, on- and off-site consequences of water erosion</li> <li>- Forms of water erosion : interrill, rill, gully</li> <li>- Factors of water erosion : rain, soil, terrain, cultural practices, crop</li> <li>- Processes: detachment, transportation, storage</li> <li>- Measurement of erosion</li> <li>- Empirical ( RUSLE ) and deterministic modelling</li> </ul>

	<ul style="list-style-type: none"> <li>- Principles and methods of soil conservation</li> <li>* Wind erosion (2h)</li> <li>* Tillage erosion (2h)</li> </ul> <p>As part of the section on water erosion, a collective brainstorming will be conducted around the fictional development of a site subject to muddy floods. The discussion will focus on the challenges of mastering soil erosion, actors and levers. Through role play, students will be encouraged to think about the complexity of managing an environmental issue.</p> <p>Practicals</p> <p>Soil Conservation</p> <ul style="list-style-type: none"> <li>- Use of the RUSLE model on simple and complex slopes, and management of a small virtual watershed</li> <li>- Evaluation of a grass strip</li> <li>- Measurement of saltation ( wind erosion)</li> <li>- Estimation of tillage erosion on complex slope (spreadsheet)</li> </ul>
Inline resources	Moodle
Bibliography	<p>Ouvrage de référence : 'Soil conservation' de R.P.C. Morgan</p> <p>Transparents des cours sur Moodle</p> <p>Syllabus pour la partie drainage et pour la partie RUSLE (sur iCampus)</p>
Other infos	!!! ATTENTION, this course will NOT be taught in 2024-2025 !!!
Faculty or entity in charge	AGRO

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Civil Engineering	GCE2M	4		
Master [120] in Forests and Natural Areas Engineering	BIRF2M	4		
Master [120] in Environmental Bioengineering	BIRE2M	4		
Master [120] in Agriculture and Bio-industries	SAIV2M	4		
Master [120] in Agricultural Bioengineering	BIRA2M	4		