UCLouvain

lbres2105

2020

Soil erosion and conservation

Due to the COVID-19 crisis, the information below is subject to change, in particular that concerning the teaching mode (presential, distance or in a comodal or hybrid format).

4 credits	22.5 h + 22.5 h	Q2

Teacher(s)	Bielders Charles ;
Language :	English
Place of the course	Louvain-la-Neuve
Main themes	- Water, wind and tillage erosion : physical processes and quantification - Modeling of water erosion at plot and watershed scale - Principles of soil conservation in temperate and tropical environments - Soil conservation techniques and practices : physical, agronomical, vegetative, and management practices
Aims	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 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: - Will master the main mechanisms involved in the degradation of soil by water , wind and tillage erosion; - Will be able to propose a methodology on an experimental basis to quantify land degradation by water erosion at the plot scale or watershed ; 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 ; - 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; - 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. - be able to position himself with respect to the management of soil erosion and muddy floods - - - - *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.** Soil conservation - 3 oral questions with written preparation (1 hour) (40%) - Evaluation of practicals, based on written report (40%) - Participation in the role play (20%)
Teaching methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** - The lectures are given in English, but always illustrated by transparencies in French. - Reference book in English. - Practical work in the computer room lead the student to operational use of the RUSLE model. - Practical work in the laboratory (grass strip, wind erosion) - Exercise sessions (tillage erosion) - The practicals, to be carried out in a team, and report writing stimulate collective work and the development of skills related to professional communication; - Role play regarding the management of soil erosion for a fictitious site
Content	Lectures - Definitions, on- and off-site consequences of water erosion - Forms of water erosion : interrill, rill, gully - Factors of water erosion : rain, soil, terrain, cultural practices, crop - Processes: detachment, transportation, storage

	- Measurement of erosion - Empirical (RUSLE) and deterministic modelling - Principles and methods of soil conservation * Wind erosion (2h) * Tillage erosion (2h) 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. Practicals Soil Conservation - Use of the RUSLE model on simple and complex slopes, and management of a small virtual watershed - Evaluation of a grass strip - Measurement of saltation (wind erosion) - Estimation of tillage erosion on complex slope (spreadsheet)
Inline resources	Moodle
Bibliography	Ouvrage de référence : 'Soil conservation' de R.P.C. Morgan Transparents des cours sur Moodle Syllabus pour la partie drainage et pour la partie RUSLE (sur iCampus)
Other infos	SGED master's students do not follow the part concerning tillage erosion, lab practicals, and role play. On the other hand, they will be asked to write a technical sheet on a soil conservation technique and to present this technique in 10 minutes in front of the class.
Faculty or entity in charge	AGRO

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Agricultural Bioengineering	BIRA2M	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		
Advanced Master in Environmental Sciences and Management in Developing Countries	SGED2MC	3		