LBRES2105
2010-2011

Drainage and soil conservation

5.0 credits	30.0 h + 22.5 h	2q

Teacher(s) :	Bielders Charles ;
Language :	Français
Place of the course	Louvain-la-Neuve
Main themes :	- Water, wind and tillage erosion : physical processes and assessment - Modelling water erosion at plot and watershed scale - Principles of soil conservation in temperate and tropical areas - Soil conservation technologies : structural, agronomic, vegetative, and management measures - Functions of drainage - Characteristics of a drainage network, placement and maintenance - Design of a drainage network
Aims :	Soil conservation (4 ECTS) Upon completion of the course and practicals, the student will be able to : - explain the main mechanisms involved in soil degradation by water, wind and tillage erosion; - propose an experimental methodology for quantifying land degradation by water erosion at the scale of the plot and watershed; - use a water erosion model to evaluate the erosion risk at plot or watershed scale; - be able to explain the principles of soil conservation; - suggest practices, technologies or land management schemes for reducing erosion at the field or watershed levels that are adapted to the socio-economic and technical environment of the land users. Drainage (1 ECTS) Upon completion of the course and practicals, the student will be able to : - master the theoretical concepts that underlie water flow towards subsurface drains and the design techniques for drainage networks; - be able to evaluate the need for drainage on the basis of technical, economic and environmental considerations; - be able to design a parallel drainage network on the basis of simple equations. *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".*
Content :	The course will deal with land degradation by water, wind and tillage erosion. For each of these three types of erosion, the physical processes involved as well as the ways to evaluate them at different scales will be studied. Modelling of water erosion will be addressed. Finally, the principles of soil conservation will be introduced, followed by a brief description of the main technologies and approaches of soil conservation. The students will be required to make a short presentation in small groups regarding an erosion control practice of their choice. During the practicals, different water erosion models (for instance (R)USLE and STREAM) will be used to evaluate erosion risk and the potential effectiveness of erosion control measures. The functions, characteristics as well as the techniques for placement, dimensioning, and maintenance of irrigation networks will then be addressed. For this purpose, we will introduce the equations for dimensioning drainage networks under steady (Hooghoudt) and unsteady (Glover-Dumm, et Zeeuw et Hellinga) flow conditions. During the practicals, these equations will be used by the students for dimensioning a drainage network.
Other infos :	Evaluation The students will be evaluated on the basis of their reports on the practicals as well as through a final exam. The final exam will be oral with a written preparation, and will include problem solving as well as comprehension questions. Support Drainage : lecture notesErosion and soil conservation : reference book
Cycle and year of study :	> Master [120] in Agricultural Bioengineering > Master [120] in Environmental Bioengineering
Faculty or entity in charge:	AGRO