






3.00 credits

22.5 h + 7.5 h

Q2

Teacher(s)	Bielders Charles (coordinator) ;Delvaux Bruno ;
Language :	French
Place of the course	Louvain-la-Neuve
Main themes	<p>1 Soil forming processes and pedological processes in tropical regions (inter-tropical and Mediterranean areas): alteration complex and major constituents, identification of major soil types and their constituents (WRB system).</p> <p>2 Relations between constituents and properties: analysis of surface properties and charge through the study of permanent and variable charge models; implications for physical and physico-chemical soil properties.</p> <p>3 Diagnosis of major soil constraints in warm regions: mineral reserves, humus stocks, acidity, salinity, nutrient depletion, mass recovery, compaction, erosion, water availability: derive constraints from the knowledge of constituents-properties relationships.</p> <p>4 Remediation and management techniques, viewed through some major cropping systems and soil types.</p>
Learning outcomes	<p><b>At the end of this learning unit, the student is able to :</b></p> <p>a. Contribution de l'activité au référentiel AA (AA du programme) M1.2 ; M1.4 ; M2.2 ; M2.4 ; M6.5</p> <p>b. Formulation spécifique pour cette activité des AA du programme :</p> <p>1 At the end of the course, , on the basis of case studies, students should be able to:</p> <ul style="list-style-type: none"> <li>- Integrate morphological, mineralogical and physico-chemical properties of soils, in order to diagnose the functioning of soils of warm regions and to identify constraints</li> <li>- Establish appropriate soil management and remediation practices adapted to soil, climate and socio-economic conditions</li> </ul>
Evaluation methods	Written exam : theoretical questions and analysis of case study. Open book (computer not allowed)
Teaching methods	<ul style="list-style-type: none"> <li>- Classes, illustrated by case studies</li> <li>- Case study analyses</li> </ul>
Content	<p>Four topics will be addressed :</p> <p>Part I ' Soil forming processes and pedological processes in warm regions : use of phase diagrams (stability, solubility), recognition of major soil types via the interpretation of morphological and analytical data of typical soil profiles.</p> <p>Part II - Relations between constituents and properties: study of permanent and variable charge models, isoelectric point and point of zero charge, retention of cations and anions, phosphate adsorption, carbon storage, micro-aggregation, implications for physical and physicochemical properties of the soils .</p> <p>Part III - Diagnosis of major soils in tropical regions: determinants of fertility, estimates of stocks of humus and nutrients, diagnosis of constraints (nutrient depletion, acidity, salinity') and physical degradation (hard setting, compaction, erosion) based on morphological and analytical data.</p> <p>Part IV - Techniques of remediation and management viewed through some major cropping systems and soil types (case studies)</p>
Inline resources	Moodle
Bibliography	<p>Ouvrage de référence :</p> <ul style="list-style-type: none"> <li>- 'Soils of the tropics' de A. Van Wambeke</li> </ul>
Faculty or entity in charge	AGRO

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Advanced Master in Environmental Sciences and Management in Developing Countries	SGED2MC	3		
Master [120] in Forests and Natural Areas Engineering	BIRF2M	3		
Master [120] in Environmental Bioengineering	BIRE2M	3		
Master [120] in Agriculture and Bio-industries	SAIV2M	3		
Master [120] in Agricultural Bioengineering	BIRA2M	3		
Advanced Master in Water-Energy-Food Nexus	NEEA2MC	3		