






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>At the end of this learning unit, the student is able to :</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"> - Integrate morphological, mineralogical and physico-chemical properties of soils, in order to diagnose the functioning of soils of warm regions and to identify constraints - Establish appropriate soil management and remediation practices adapted to soil, climate and socio-economic conditions
Evaluation methods	Written exam : theoretical questions and analysis of case study. Open book (computer not allowed)
Teaching methods	<ul style="list-style-type: none"> - Classes, illustrated by case studies - Case study analyses
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"> - 'Soils of the tropics' de A. Van Wambeke
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		