



# THE FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE

*Department of Crop, Soil and Pest Management*

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## **CSP 309- Land /Soil management**

### **COURSE PARTICULARS**

**Course Code:** CSP 309

**Course Title:** Land /Soil management.

**No. of Units:** 2

**Course Duration:** Two hours of theory and three hours of practicals per week for 15 weeks.

**Status:** Compulsory

**Course Email Address:** NIL

**Course Webpage:** NIL

**Prerequisite:** NIL

### **COURSE INSTRUCTORS**

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and

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### **COURSE DESCRIPTION**

Need for soil conservation practices. Effects of deforestation, soil problems affecting crop production, methods of land clearing and the effect of bush burning. Tillage implements, soil tillage and tillage techniques; effects of tillage methods on soil and crop. Soil structure formation and improvement, structure deformation and measures to prevent it. Maintenance and improvement of soil fertility through natural and artificial processes. Irrigation methods, drainage methods, erosion control. Application of Global Positioning System (GPS). In topographical mapping. Field trip. Prerequisite to CSP 407&509.

## **COURSE OBJECTIVES**

The objectives of this course are to:

- introduce students to the problems associated with the use of tropical soils for crop production that might result from improper land clearing methods, deforestation; and
- provide students with the opportunities to develop ways of maintaining its fertility for sustainable crop production.

## **COURSE LEARNING OUTCOMES / COMPETENCIES**

Upon successful completion of this course, the student will be able to:

*(Knowledge based)*

- explain the constraints of tropical soil to crop production;
- classify and explain the function of different tillage operation equipments;
- understand purpose and functions of irrigation, drainage, mulching ;and
- carry out efficient soil management practices, ;

*(Skills)*

- use the tillage implements to:
  - perform clearing operations on the field;
- perform simple erosion and drainage control on the field ;and
- make use of the GPS equipments to map the soils on the campus for proper soil management;
- maintain soil fertility on the field.

## **GRADING SYSTEM FOR THE COURSE**

This course will be graded as follows:

Class Attendance	10%
Test(s)	20%
<u>Final Examination</u>	<u>70%</u>
<b><u>TOTAL</u></b>	<b><u>100%</u></b>

## GENERAL INSTRUCTIONS

**Attendance:** It is expected that every student will be in class for lectures and also participate in all practical exercises. Attendance records will be kept and used to determine each person's qualification to sit for the final examination. In case of illness or other unavoidable cause of absence, the student must communicate as soon as possible with any of the instructors, indicating the reason for the absence.

**Academic Integrity:** Violations of academic integrity, including dishonesty in assignments, examinations, or other academic performances are prohibited. You are not allowed to make copies of another person's work and submit it as your own; that is plagiarism. All cases of academic dishonesty will be reported to the University Management for appropriate sanctions in accordance with the guidelines for handling students' misconduct as spelt out in the Students' Handbook.

**Assignments and Group Work:** Students are expected to submit assignments as scheduled. Failure to submit an assignment as at when due will earn you zero for that assignment. Only under extenuating circumstances, for which a student has notified any of the instructors in advance, will late submission of assignments be permitted.

**Code of Conduct in Lecture Rooms and Laboratories:** Students should turn off their cell phones during lectures. Students are prohibited from engaging in other activities (such as texting, watching videos, etc.) during lectures. Food and drinks are not permitted in the laboratories.

## READING LIST

<sup>1</sup>Hugues, D and Philipee De Leener (1988). *Agriculture in African Rural communities. Crops and Soil*. Macmillan Publishers, Hong Kong. 291p.

<sup>1</sup>Hugues, D and Philipee De Leener (1998). *Trees and multi-storey Agriculture in Africa- a text book for Agro-forestry*. Macmillan Publishers, Hong Kong. 291p

<sup>1</sup>Toon, D and Arnoud, Bedelman (2000) *Managing Soil Fertility in the Tropics (1, 2, 3, 4, &5) – a resource guide for participatory learning and action research*. FAO and KIT Press. Netherlands. <http://www.kit.nl/books>.

<sup>1</sup>Thea, H. and Fred, M. (2000) . *Nutrients on the move - Soil fertility dynamics in African farming Systems*. IIED London.

### Legend

1- Available as Personal Collection

## COURSE OUTLINE

Week	Topic	Remarks
1	Introduction and Course Overview General principles of soil management - how to manage soil efficiently	During this first week of the lecture, the students will be introduced to the course and their expectation from the course will be noted.
2 & 3	Soil constraints to agricultural production. Factors of soil degradation.	Practical exercise will involve visiting the school research farm to see what obtains on the farm, observing physically the soil fertility level, observed the constraints and the crops on the field.
4 & 5	Maintenance of soil fertility. <ul style="list-style-type: none"> <li>• Definition of soil fertility</li> <li>• Shifting cultivation</li> <li>• Live mulch</li> <li>• Agro forestry</li> <li>• Alley cropping</li> <li>• Intercropping/multiple cropping</li> <li>• Alley cropping</li> </ul>	Students will be made to discuss the different methods in a participatory way.
6	Land clearing: - Ecologically land clearing methods - Guidelines for land clearing	Visit to the University farm and local farms will be done to compare the land clearing methods.
7 & 8	Tillage <ul style="list-style-type: none"> <li>• Purposes of tillage.</li> <li>• Types of tillage               <ul style="list-style-type: none"> <li>(a) Convectional tillage</li> <li>(b) Minimum tillage</li> <li>(c) Zero tillage.</li> </ul> </li> </ul>	Students will be made to compare and contrast on the different forms of tillage and agree on suitability of the mulch types to the different locations in Nigeria.
		<b>MID-SEMESTER TEST</b>
9 & 10	Mulching <ul style="list-style-type: none"> <li>• Definition</li> <li>• Purposes</li> <li>• Effects of mulching on soil productivity</li> <li>• Types of mulch.</li> <li>• Ways to procure mulching materials.</li> </ul>	Students will be made to apply different mulch types to field and study the decomposition rates.

11 & 12	<p>Erosion and soil mapping</p> <ul style="list-style-type: none"> <li>• Erosion causing factors</li> <li>• Types of erosion.</li> <li>• Mechanics of water erosion.</li> <li>• Measuring erosion</li> <li>• Controlling water erosion.</li> <li>• Wind erosion.</li> <li>• Mechanics of wind erosion</li> </ul>	<p>Students will be taken to the field for practical observation and evaluation of erosion types and suggested possible solution would be noted for action.</p>
13 & 14	<p>Soil- water –plant relationships and Irrigation</p> <ul style="list-style-type: none"> <li>• Advantages of irrigation</li> <li>• Purpose of irrigation</li> <li>• Principles of irrigation</li> <li>• Problems of irrigation</li> <li>• When to irrigate</li> <li>• How much water to apply during irrigation.</li> <li>• Irrigation method or systems,</li> </ul>	<p>Students will be made to understand the way water moves in the soil (mass flow) and its uptake. Simple calculation relating to available water, field capacity and wilting percentage will be practised in the class.</p>
15	REVISION	<p>This is the week preceding the final examination. At this time, evaluation will be done to assess how far the students’ expectations for the course have been met.</p>