NATIONAL OPEN UNIVERSITY OF NIGERIA

SLM 303

Introduction to Pedology and Soil Physics

Course Guide

SLM 303 (Introduction to Pedology and Soil Physics) Course Guide

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Introduction

Soils play a vital role in the quality of our environment. For example, soil impacts the quality and quantity of our food, and serves as foundation of our structures, as well as interact with the hydrosphere and atmosphere. Soil can be a source, a sink, or an interacting medium for many nutrients, as well as contaminants that impact humans, plants, wildlife, and other organisms. An understanding of soil properties and processes is therefore critical to the evaluation of the criteria to be adopted for the soil management. The objective of the course is to be aware of chemical and biological reactions that may influence the behaviour of contaminants according to the different soil types and properties. Because soil is important for cultivation and agricultural production, soil fertility and productivity are important issues to address.

Detailed pedological knowledge is useful for land evaluation purposes, i.e. the classification in fertile productive soils and less valuable soils. Soils are an integral part of landscapes and the knowledge of the distribution of different soils helps to preserve a high standard in environmental quality. For example, site specific management cannot be developed without detailed knowledge of soils. Critical sites, e.g. shallow hill slope soils prone to erosion and leaching of nutrients, can be identified using pedology. Soil surveys furnish basic inputs to soil conservation planning and provide information used in equations for predicting soil loss and water pollution under various management practices on different soils.

Prerequisites

The background knowledge from biology, chemistry, biochemistry and geology is required.

What You Will Learn in this Course

The course consists of modules in units and a course guide. This course guide tells you briefly what the course is about, what course materials you will be using and how you can work with these materials. In addition, it advocates some general guidelines for the amount of time you are likely to spend on each unit of the course in order to complete it successfully.

It gives you guidance in respect of your Tutor-Marked Assignment which will be made available in the assignment file. There will be regular tutorial classes that are related to the course. It is advisable for you to attend these tutorial sessions. The course will prepare you for the challenges you will meet in the field of soil pedology and classification.

Course Aims

The aim of the course is not complex. The course aims to provide you with an understanding of soil pedology and classification; it also aims to provide you with solutions to problems with soil classification in the field.

Course Objectives

To achieve the aims set out, the course has a set of objectives. Each unit has specific objectives which are included at the beginning of the unit. You should read these objectives

before you study the unit. You may wish to refer to them during your study to check on your progress. You should always look at the unit objectives after completion of each unit. By doing so, you would have followed the instructions in the unit.

Below are the comprehensive objectives of the course as a whole. By meeting these objectives, you should have achieved the aims of the course as a whole. In addition to the aims above, this course sets to achieve some objectives. Thus, after going through the course, you should be able to:

- explain the concept of soil its origin and formation
- study the morphological characteristics of soil
- identify the basic soil components
- explain the concept of soil forming rocks and minerals
- explain the concept of weathering of rocks and minerals
- description of soil profile
- facts about soil survey
- steps in soil mapping
- steps in soil classification
- to study the properties and management of Nigerian soils.

Working through the Course

To complete this course you are required to read each study units, read the textbook and other materials which may be provided by the National Open University of Nigeria. Each unit contains self-assessment exercises and at certain points in the course you would be required to submit assignment for assessment purpose. At the end of the course there is a final examination. The course should take you a total of 17 weeks to complete. Below you will find listed all the components of the course, what you have to do and how should allocate your time to each unit in order to complete the course on time and successfully.

The details that you spend a lot of time to read. I would advise that you avail yourself the opportunity of attending the tutorial sessions where you have the opportunity of comparing your knowledge with that of other people.

The Course Materials

The main components of the course are:

The Course Guide

Study Units

References/Further Reading

Assignments

Presentation Schedule

Study Units

The study units in this course are as follows:

Module 1 Soil Origin, Formation, Morphological Characteristics and Components

Unit 1 Origin of Soil

Unit 2 Soil Formation

Unit 3 Soil Morphology

Unit 4 Soil Characteristics

Unit 5 Soil Components

Module 2 Soil- Forming Rocks and Minerals and Weathering of Rocks and Minerals

Unit 1 Soil- Forming Rocks

Unit 2 Weathering of Rocks and Minerals

Unit 3 Profile Description and Soil Survey

Unit 4 Soil Mapping

Unit 5 Soil Classification

Module 3 Properties and Management of Nigerian Soils

Unit 1Nigerian Soils

Unit 2 Properties of Nigerian Soils

Unit 3 Profile Description of Nigerian Soils

Unit 4 Classification of Nigerian Soils

Unit 5 Management of Nigerian Soils

Your course materials have important dates for the early and timely completion and submission of your TMAs and attending tutorials. You should remember that you are required to submit all your assignments by the stipulated time and date. You should guard against falling behind in your work.

Assessment

There are three aspects to the assessment of the course. First is made up of self-assessment exercise, second consist of the tutor-marked assignments and third is the written examination/end of course examination. You are advised to do the exercises. In tackling the assignments, you are expected to apply information, knowledge and techniques you

gathered during the course. The assignments must be submitted to your facilitator for formal assessment in accordance with the deadlines started in the presentation of schedule and the assignment file. The work you submit to your tutor for assessment will count for 30 % of your total course work. At the end of the course you will need to sit for a final or end of course examination of about three hour duration. This examination will count for 70 % of your total course mark.

Self-Assessment Exercise

The TMA is a continuous assessment component of your course. It accounts for 30 % of the total score. You will be given four (4) TMAs to answer. Three of these must be answered before you are allowed to sit for end of course examination. The TMAs would be given to you by your facilitator and return after you have done the assignment. Assignment questions for the units in this course are contained in the assignment file. You will be able to complete your assignment from the information and material contained in your reading, references and study units. However, it is desirable in all degree level of education to demonstrate that you have read and researched more into your references, which will give you a wider view point and may provide you with a deeper understanding of the subject.

Make sure that each assignment reaches your facilitator on or before the deadline given in the presentation schedule and assignment file. If for any reason you cannot complete your work on time, contact your facilitator before the assignment is due to discuss the possibility of an extension. Extension will not be granted after the due date unless there are exceptional circumstances.

Final Examination and Grading

The end of course examination for introduction to Soil Pedology and Classification will be for about 3 hours and it has a value of 70 % of the total course work. The examination will consist of questions, which will reflect the type of self-testing, practice exercise and tutor-marked assignment problems you have previously encountered. All areas of the course will be assessed.

Use the time between finishing the last unit and siting for the examination to revise the whole course. You might find it useful to review your self-assessment exercises, TMAs and comments on them before the examination. The end of course examination covers information from all parts of the course.

Course Marking Scheme

Assignment	**Marks**
Assignment 1-4	Four assignments, best three marks of the four count at 10 % each -30 % of course marks
End of course examination	70 % of overall course marks
Total	100 % of course materials

Facilitators/Tutors and Tutorials

There are 16 hours of tutorials provided in support of course. Your will be notified of the dates, times and location of these tutorials as well as the name and phone number of your facilitator, as soon as you are allocated a tutorial group.

Your facilitator will mark and comment on your assignment, keep a close watch on your progress and any difficulties you might face and provide assistance to you during the course. You are expected to mail your Tutor Marked Assignment to your facilitator before the schedule date (at least two working days are required). They will be marked by your tutor and returned to you as soon as possible. Do not delay to contact your facilitator by telephone or e-mail if you need assistance.

The following might be circumstances in which you would find assistance necessary, hence you would have to contact your facilitator if:

- you do not understand any part of the study or the assigned reading.
- you have difficulty with the self-tests
- you have a question or problem with an assignment or with grading of an assignment.

You should endeavour to attend the tutorials. This is the only chance to have face to face contact with your course facilitator and to ask questions which are answered instantly. You can raise any problem encountered in the course of your study.

To gain much benefit from course tutorials prepare a question list before attending them. You will learn a lot from participating actively in discussions.

Summary

Introduction to Soil Pedology and Classification is a course that intends to provide concept of the discipline and concerned with knowledge of soil origin and formation, types, properties, fertility and management for sustainable agriculture and land management. In addition you will be able to answer the following type of questions:

- How did soil evolve and its formation?
- State the morphological characteristics of soil.
- Identify the basic soil components.
- Explain the concept of soil- forming rocks and minerals.
- Explain the concept of weathering of rocks and minerals.
- Describe the concepts in soil survey, mapping and classifications.
- Discuss the properties and management of Nigerian soils.

Of course, the list of questions that you can answer is not limited to the above list. To gain the most from this course you should Endeavour to apply the principles you have learnt to your understanding of Soil Pedology and classification.

I wish you success in the course and hope that you will find it both interesting and useful.