



THE FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE

Department of Forestry and Wood Technology

FWT 317 - Natural Ecosystem and Plant Taxonomy

COURSE PARTICULARS

Course Code: FWT 317

Course Title: Natural Ecosystem and Plant Taxonomy

No. of Units: 2

Course Duration: One hour of theory and three hours of practical per week for 15 weeks.

Status: Compulsory

Course Email Address: fwt204@gmail.com

Course Webpage: <http://www.fwt.futa.edu.ng/courseschedule.php?coursecode=FWT%20204>

Prerequisite: NIL

COURSE INSTRUCTORS

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COURSE DESCRIPTION

Distribution, structure and dynamic of land and fresh water ecosystems with special reference to West Africa; the flow of energy and materials through natural ecosystems; the importance of conservation: environmental conservation and tree genetics. The forest ecosystem concept: energy dynamics at producer and consumer tropic levels. Photosynthetic efficiency of forest; nutrient cycling in forest ecosystem (geochemical and biological nutrient cycling). The tropical forest communities (vertical and horizontal structures). Classification of forest trees (families of trees) and their relationships to ecological zones; morphology, taxonomy and ecology of tropical

trees. Variation and modifications of plant morphology and biodiversity indices. Plant collection and herbarium techniques.

COURSE OBJECTIVES

The objectives of this course are to:

- Learn the techniques for identification of tree taxa through field recognition, specimen collection and descriptions and characterization of morphotypes (morphospecies concept) for subsequent vegetation assessment
- Learn the use of identification keys for appropriate determination of a set of voucher specimens to be collected from the field.
- Learn alternative methods for rapid plant biodiversity assessment in complex, species rich tropical rainforests
- To construct species-area curves in various land-use systems and understand their implications for the design of sampling protocols.
- Understand the principle of nutrient cycling in forest ecosystem.
- Understand the principles of Energy flow in forest Ecosystem.

COURSE LEARNING OUTCOMES / COMPETENCIES

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

(Knowledge based)

- Collect, preserve, process and present plant specimen (herbarium specimen) in accordance with scientific standard
- Identify at least 50 trees to order, family, genus, and species level using taxonomic keys
- Describe characteristic of Nigeria vegetation and ecosystem
- Describe energy flow in Nigeria ecosystem

(Skills)

- Construction of Species-Area Curve And Biodiversity Indices
- Carry out Rapid Plant Biodiversity Assessment;
- Preparation of herbarium samples to build herbarium for reference purposes.

GRADING SYSTEM FOR THE COURSE

This course will be graded as follows:

Class Attendance	10%
Field Trip and report writing	30%
Test(s)	10%
<u>Final Examination</u>	<u>50%</u>
<u>TOTAL</u>	<u>100%</u>

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.

READING LIST

Kinako, P. S. *Fundamentals of quantitative applied plant Ecology*. Call No. QK901.k51 FUTA (Main Library)

Ghazoul, J. *Tropical rain forest Ecology, Diversity and Conservation*. Call No. QH511.5.R27G411 FUTA (Library)

Dutta, H. C. *Botany for degree Student* Call No. QK47.D87 (FUTA Main Library)

Causton, D. R. ()¹ *An Introduction to vegetation analysis –Practice and Interpretation* Call. No. QK901.C374

More literature are available at the University and Departmental/School Libraries, he Internet, Personal Collection and in local bookshops.

Week	Topic	Remarks
1	Introduction and Course Overview Classification of Trees	During this first class, the expectation of the students from the course will also be documented.
2 & 3	Families of trees and their relationship with ecological zones <ul style="list-style-type: none"> • Flora: Plant aspect – trees, shrubs, climbers, creepers, herbs) • Fauna: (animals) • Importance of vegetation study • Plant community 	
4 & 5	Description of a Plant <ul style="list-style-type: none"> • Root system: Buttress, Root system with stilt root system • Root system with Finger-like projection call Pneumatophores • Another type of root system is found in <i>Milicea excelsa</i> (wks)- Lenticels appearance. Shoot System <ul style="list-style-type: none"> • Attributes used to describe a stem: Size of bole; Shape of bole, colour of the bark, appearance of markings, appearance of thorns or spines, • Slash character: Texture of the bark, colour of the bark, emergence of exudates • Shoot/twigs: monopodial, dichotomous, sympodial, etc. • Leaf arrangement: alternate, spiral, opposite, venticilate etc Advantages of vegetative classification	
6	Flower arrangement <ul style="list-style-type: none"> • Solitary 	

	<ul style="list-style-type: none"> • Multiple • Position of inflorescence Types of inflorescence <ul style="list-style-type: none"> • Characters used in flower description. • Arrangement of the floral parts. • Symmetry of the flower • Number of floral parts • Union of the parts • Position of floral leaves on thalamus • Stamen structure/attachment of the filament. • Ovary structure e. g. marginal, exile, parietal, central, free-central, basal, superficial • Flora diagram formula • Fruits: type of fruits 	
7 & 8	Procedure for Plant Identification The use of existing herbarium The use of key Numerical keys <ul style="list-style-type: none"> • Graphical or tabular keys • Indented keys • Bracketed keys • Card keys 	Students will be requested to prepare a well formatted document as assignment. MID-SEMESTER TEST
9 & 10	<ul style="list-style-type: none"> • Plant Classification • Units for plant Classification: • Illustration on how this system works Naming of plants <ul style="list-style-type: none"> • Advantages & disadvantages of using scientific names 	
11	Herbarium Technique <ul style="list-style-type: none"> • Collection of specimen: Materials needed for collection • Collection procedure: • Preparation of specimen: Pressing, mounting, labelling, • Housing e.g. bulky materials: Dry treatment, liquid preservatives Arboreta, Provenance Collection And Clone Archive	
12	Photosynthetic efficiency of forest Nutrient cycling in forest ecosystem <ul style="list-style-type: none"> • geochemical and • biological nutrient cycling 	
13 & 14	Basic Ecological concepts : <ul style="list-style-type: none"> • Components of an Ecosystem Local Biotic communities or Biomes in Nigeria	

	<ul style="list-style-type: none"> • Forest zones • Mangrove swamp forest • Mangrove Forest • Tropical rain Forest • Guinea Savannah • Sudan Savannah • Sahel Savannah <p>Ecological factors: Biotic factor, Competition, parasitism, commensalism, predation, pathogen, Mortality, migration etc</p> <p>Ecological Factors Common to all Habitats e.g. Temperature, Rainfall, Light, Wind, Pressure, Hydrogen concentration.</p> <p>Food Chain and Food Web Energy Transfer in an ecosystem.</p>	
15	REVISION	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.