NATIONAL OPEN UNIVERSITY OF NIGERIA

BIO 407

Basic Entomology

Course Guide

BIO 407 Basic Entomology Course Guide

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Introduction

Entomology majorly refers to the study of insects and all that surround them. The fact is that today's human population is a drift in a sea of insects. If we look at numbers alone, the estimated ratio of insects to humans is 200 million to 1, and there are about 40 million insects for each acre of land.

Along with humans, insects live in almost every habitable place on the earth, except the ocean depths. Some distinguished entomologists affirm that insects own the land. They are chief consumers of plants; they are the major predators of plant eaters; they play a major role in decay of organic matter and they serve as food for other kinds of animals.

The content of this course shall guide the students and individuals at all levels of educational learning to promote an understanding of major elements of general entomology.

Course Aims

This course aims at providing basic understanding about insects; it throws light into its evolvement, different classification and distribution of insects, organisation of external features, body organs, systems and castes composition of social insects.

Course Objectives

In addition to the aims above, this course set to achieve some objectives. After going through this course, you should be able to:

- explain the evolution of insects, list the general characteristics of insects and align it with factors that contribute to their success in the environment
- assess the beneficial and detrimental effect of insects to plants and animals in their environment
- identify common insect species using their basic features and classify species into their respective families and orders, as well bring out similarities in members of same species
- list the different types of mouth parts, wings and their modifications in the insect body for different functions
- describe the individual organ systems, which function simultaneously to achieve the overall process, including feeding and digestion, respiration, blood circulation, waste excretion and nervous system
- identify the most dread insects pests of human dwellings and other structures, the different caste composition and their biological role and identify the behavioural adaptations of termites and honey bees to their environment.

Working through the Course

Huge amount of effort was put together into developing this course and thereby enriching it with a lot of useful information for all categories of individuals in all levels of learning.

However, it requires that concerted effort is made in reading through this material for appreciating the effort and in-depth acquisition of the desired knowledge as you spend good time to read through it. You are likewise encouraged to read through and practice all assignments mapped out in this material.

Course Materials

You will be provided with the following course guide (materials) and study units. In addition, the course comes with a list of recommended textbooks which though are not compulsory for you to acquire or indeed read, but are necessary as supplements to the course material.

Study Units

There are two (2) modules in this course broken down as follows:

Module 1

Unit 1 Insect Evolution

Unit 2 Classification and Distribution of Insects

Module 2

Unit 3 Organisation of External Structure

Unit 4 Maintenance and Locomotion

Unit 5 Social Insects

Textbooks and References

The under listed books are recommended for further reading

Fabian, O. (1985). *Outlines of Stored Products Entomology.*

Larry, P.P. (2004). *Entomology and Pest Management.* (4th ed.). p.84.

Natural Resources Institute (1996). A Guide to Insect Pest of Nigerian Crops. Identification, Biology and Control. p.101.

Peter Fab and the Editors of Life (1964). The Insects. p.92

Assignment File

There are two components of assessment for this course: The Tutor-Marked Assignment (TMA) and the end of course examination.

Self-Assessment Exercises

The TMA is the continuous assessment component of your course. It accounts for 30% of the total score. You will be given five TMAs to answer. Three of these must be answered before you are allowed to sit for the end of course examination. The TMAs would be given to you by your facilitator and return after you have done the assignment.

Final Examination and Grading

The examination concludes the assessment for the course. It constitutes 70% of the whole course. You will be informed of the time for the examination.

Presentation Schedule

The *Presentation Schedule* included in your course materials gives you the important dates for the completion of tutor marked assignments and attending tutorials. Remember, you are required to submit all your assignments by the due date. You should guard against lagging behind in your work.

Course Marking Scheme

This Table shows how the actual course marking is broken down.

Assessment	**Marks**
Assignment 1- 4	Four assignments, best three marks of the four count at 30% of course marks
Final Examination	70% of overall course marks
Total	100% of course marks

Course Overview

This course guide tells you briefly what to expect from reading this material which bothers on basic entomology.

The study of entomology, discusses evolution of insect from early ancestors i.e. earthworm, outlines the major characteristics of insects that contributes to insects in their environment. The details are discussed therein. Insects are known to have beneficial and detrimental effects on living creatures both plants and animals. This course guide shall explain further on this aspect. For adequate scientific understanding of this course, insect classification and distribution was put in place in this course guide. This will enable individuals of all categories of learning to correctly place insects of all kinds in the right, phylum, class, order, family, genus and species. Each insect is given a scientific name, this we refer to as binomial nomenclature. This course guide discusses in detail the right approach to classification and assigning names to individual insects.

The best approach to grouping of segments of insects into functional regions is called Tagmatisation. Features of the various segments and their modifications for their functions in the body of insects are discussed. A representative insect *Periplanetta americanus* (cockroach) was used to highlight all functional features and their modifications in the body of the insect.

Individual organs and systems function simultaneously as a cosmos of interdependent and interacting system, so contribute in part of the success of insects in their environment. Social insects were not underestimated in their functional role in their castes. They live in groups in communal nests and undergo division of labour. The termite society is based on castes with members of each caste differing from those of other castes include primary reproductive's (kings and queens), supplementary reproductive's, workers and soldiers.

How to Get the Most from This Course

Implicit interest and regular culture of reading are of utmost requirements for getting the best out of this course. It is paramount that you should at least purchase one of the textbooks that are recommended for you. More importantly, attending tutorials sessions and completing your assignments on time will certainly assist you to get the best out of this course.

Summary

This course intends to provide you with some underlying knowledge of entomology; the following questions are expected to be adequately answered by the student after completely studying this course:

- What are the beneficial and detrimental effects of insects to us in Nigeria?
- List 5 characteristics of insects that accounts for their success in their environment
- Discuss the major classification of insects
- Outline similarities in members of insects of same species
- What is the binomial nomenclature of cockroach
- Define Tagmatisation in insects
- Classify insect head according to their orientation with mouth parts
- List different types of antenna in insects based on their modifications
- Enumerate the insect leg modifications to their functions
- State 3 types of feeding in insects
- Discuss the different organ-systems in insects
- What are social insects

- Distinguish between termites and ants
- State the behavioural adaptations of termites and bees.

We wish you success in this course. We hope you should be able to appreciate the field of entomology and beneficial and detrimental roles insects play in living organisms and the society at large.