

UNIVERSITY OF NAIROBI

SCHOOL OF BIOLOGICAL SCIENCES

SZL 404: BASIC ENTOMOLOGY

A. INTRODUCTION

Entomology refers to the study of insects and all that surround them. Along with humans, insects live in almost every habitable place on the earth. 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. This course shall guide the students and individuals at all levels of educational learning to promote an understanding of major elements of general entomology.

B. THE COURSE

This course guide tells student briefly what to expect from this course. The study of entomology, discusses evolution of insects and outlines the major characteristics of insects that contributes to insects in their environment. Insects are known to have beneficial and detrimental effects on living creatures both plants and animals. For adequate scientific understanding of this course, insect classification and distribution will be covered. 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 is referred to as binomial nomenclature. This course will cover 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 tagmatization. Features of the various segments and their modifications for their functions in the body of insects are discussed. A representative insect *Periplanetta americana* (cockroach) will be 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 will not be 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 and supplementary reproductives, workers and soldiers.

C. COURSE AIMS

This course aims at providing basic understanding about insects, the course highlights its evolution, different classification and distribution of insects, organization of external features, body organs, systems and castes composition of social insects.

D. 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:

1. Understand the evolution of insects, list the general characteristics of insects and align it with factors that contribute to their success in the environment.
2. Assess the beneficial and detrimental effect of insects to plants and animals in their environment.

3. 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.
4. Understand the different types of mouth parts, wings and their modifications in the insect body for different functions.
5. Understand the individual organ systems, which function simultaneously to achieve the overall process, including feeding and digestion, respiration, blood circulation, waste excretion and nervous system
6. Identify the most important insect pests, the different caste composition and their biological role and identify the behavioural adaptations of termites and honey bees to their environment.

E. COURSE MATERIALS

Students will be provided with the course guide. In addition, the course comes with a list of recommended textbooks which though are not compulsory to acquire or indeed read, are necessary as supplements to the course material

Insect Evolution

- Insect Evolution
- Insect Evolution
- Characteristics of Insects
- Success of Insects
- Beneficial effect of Insects
- Dentrimental effect of Insects

Classification and distribution of insects

- Elements of classification
- General classification of Insects
- Sub class Apterygota
- Sub class Pterygota

Organization of external structure

- Tagmatization
- The head
- The antenna
- The mouth part
- The thorax
- Insect legs
- Insect wings
- Abdomen
- Spiracles

Maintenance and locomotion

- Digestive system
- Excretory system
- Respiratory system

- Circulatory system
- Nervous system
- Insect reproduction
- Growth in insects
- Ecdysis/moulting
- Metamorphosis
- Insect development
- Biology of the Cockroach (*periplanetta Americana*)

Social Insects

- The Termites
- Castes and Social Insects
- Behavioural Adaptation of Termites
- The Bees
- Behavioural Adaptation of Bees

F. TEXT BOOK AND REFERENCES

- Fabian, O. (1985). Outlines Of Stored Product Entomology
- Larry, P.P. (2004). Entomology and Pest Management. 4th Edition 84pp
- Peter Fab and The Editors of Life. (1964). The Insects. 92pp