ADEYEMI COLLEGE OF EDUCATION
ONDO, ONDO STATE

DEPARTMENT OF BIOLOGY

DEGREE PROGRAMME

COURSE OUTLINE

Degree Offered: B Sc. Education (Biology)

DESCRIPTION OF BOTANY COURSES

Course Code: BOT 101

Course Title: Form and Function in Plants I

Course Outlines

Plants as living organisms. Differences between plants and animals, Plants and human affairs

i. The plant cells, its general structure and activities.
ii. The possible origin of living matter, DNA, RNA, Chromosomes, prokaryotic and eukaryotic cells and Cell divisions
iii. Plant classification, its history, objectives and relevance to human activities, Diversity of plants.
iv. Viruses, Bacteria, Fungi, Algae, Lichens, Bryophytes, Pteridophytes, Gymnosperms, Angiosperms.
v. The morphology, structure and functions of the root, stem,leaf,fowers, fruits and seeds of angiosperm plants.
vi. Identification of major groups of plants Introduction to economic botany.

Course Code: BOT 102

Course Title: Introductory Botany I.

Course Outlines

i. Variety of forms, classification and evolution in plant kingdom.

ii. Elementary treatment of cryptogams, Algae, Fungi, Bryophytes, their distributions, Classification, Morphology, Reproduction and Economic importance. Evolution and significance of the seed habit in the spermatophytes (non-flowering and flowering seed plants.)

iii. Elementary treatment of the anatomy and morphology of angiosperms: Simple and complex tissue system in roots, stems and leaves, scope of morphology-external and internal morphology; morphology of plant organs

iv. Root morphology and variations; leaf morphology and variations; morphology of inflorescence and flowers, Fruit morphology and variations.

Course code: BOT 201.

Course Title: Form and Functions in Plants II

Course Outlines

i. Living and non-living things. Plants and other living things, Structure of plant cells. Structural patterns in plants. Nutrition: Sources of metabolites uptake of nutrients.

ii. **Translocation.** Inorganic nutrition. Organic nutrition, photosynthesis, synthesis of other organic substances Respiration. Elimination of materials plant growth.

Growth and development: pattern of growth. Growth in multi-cellular plants. Factors influencing plant growth, Plant growth substances. Reproduction: Asexual and sexual reproduction.

iii. **Enzymes:** Activation energy Mechanisms of action. Properties, composition, Types, Factors affecting activity. Interactions amongst organisms: Social and nutritive interactions.

Pre-requisite: BOT 101.

Course code: BOT 202

Course Title: Biometry

Course Outlines

Purpose and relevance of Biometry Population and Samples Frequency distributions. Data gathering and presentation.

Mean, variance and standard error. Probability. Normal Poison and binomial distributions

Confidence limits. Analysis of variance (ANOVA). Non-parametric tests in lieu of ANOVA: Regression and correlation, Analysis frequencies, contingency table and X-tests. t-Test, Z-test and F-test.

Factorial experiments.

Pre-requisite: 'O'Level Mathematics

Course code: BOT 203

Course Title: Introductory Genetics

Course Outlines

The subject matter Genetics. Heritable and non-heritable traits. Short history of Genetics. Sexual and asexual reproduction. Chromosome number and structure, chromosome and genes. Meiosis and mitosis; alternation of generations. The transmission of hereditary characters: Mendelism gene interact on; quantitative genetics. Cytoplasmic inheritance, sex determination and sex linkage.

Probability in Genetics. Linkage and recombination. Genetics of Lower organisms viruses

bacteria and fungi.

The molecular basis of heredity. Introduction to population genetics. Introduction to evolution and its processes.

Pre-requisite: BOT 101

Course code: BOT 204

Course Title: Plant Morphology

Course Outlines

General organization of the angiosperm plant body Treatment of the variations in the morphology of the root, stem, leaves, inflorescences, flowers, fruits and seeds of angiosperm plants Introduction to plant description and identification.

Course code: BOT 301.

Course Title: Whole Plant Physiology

Course Outlines

Chemical background:

Cell structure and function: Water relations of cells Cell wall and growth of cell

Soil and mineral nutrition Uptake and movement of water

Uptake and transfer of solutes, Translocation of solutes

Partitioning and control mechanisms, Leaves and atmospheres

Water loss-Transpiration

Pre-requisite: BOT 201

Course code: BOT 302

Course Title: Plant Anatomy

Course Outlines

The Plant cell; cell organelles and their functions

Meristems and cell differentiation

Cell types, mature tissues and tissues systems, Secondary growth in Plants. The internal structure of the stem, root, leaves, flowers, fruits and seeds of monocotyledonous and dicotyledonous plants.

The periderm; its structure and functions. The structure of plant organs in relation to their function and ecological modification. Emphasis to be placed on tissue identification.

Pre-requisite: BOT 204

Course code: BOT 303

Course Title: Angiosperm Taxonomy

Course Outlines

The objectives of plant Taxonomy and its relevance to human activities

History of plant Classification. Evolution and unit of plant classification.

Evolution and its significance to taxonomy

Principles and concepts of plant taxonomy, classification, nomenclature, identification.

Current systems of classification; Taxonomic Characters

Taxonomic literature

Introduction to plant Geography

Treatment of selected orders and families of plants (dicotyledons and monocotyledons)

Herbarium practice, organization and management

Introduction to the preparation of local flora

Emphasis will be placed on plant identification, at least, to the family level.

Pre-requisite: BOT 204

Course code: BOT 304

Course Title: Systematics of non – flowering plants

Course Outlines

Historical survey of the development of ideas and methods of approach concerning the Systematics of non-flowering plants. Evolution of the earliest plants. Structural organization, primary classification and relationships of the Thallophyta, lichens, Bryophyta, pteridophytics and Gymosperms. Preble is of terrestrial environment.

Review of evolution towards the root, stem, leaf and flower of the Anthophyta.

Origin of the Anthophyta.

Fre-requisite: BOT 101

Course code: BOT 305

Course Title: Autecology

Course Outlines

. Units of Ecology

Environmental factors: Population, community, ecosystem, biosphere.

Populations growth, interrelations, dynamics, Loka - Velfera equations (differential and difference equations)

Estimation of importance cover, density, frequency yield.

Organism and population relationships: intra and inter-specific competition

predation, symbiosis including excretory and sense organs of vertebrates.

Geologic timescale, fossil studies, their importance in the study of comparative vertebrate Anatomy.

Description Of Zoology Courses

Course code: Zoo 101

Course Title: Introductory Zoology I

Course Outlines

Animal Complexity- Acellular and metazoan. Grades of organization, protoplasmic grade (protozoa) cellular grade, cell-tissue grade, tissue-organ and organ system grades. Animal embryology type of eggs, fertilization, cleavage, gastrulation differentiation of tissues, organs and systems.

Outine of animal classification, Diversity of invertebrate animal life. Acellular animal (protozoa):e.g Amoeba, Paramecium, Euglena and Trypanosoma. Radiate animals Coelomate) e.g. Hydra and Obelia, Acoelomate animals (platyhelminthes) e.g.Ascaris coelomate animals (segmented worms e.g earthworm): Mollusca e.g. land snails and cephalopods. Athropods-aquatic madibulates e.g crayfish (Cnustacea) and terrestrial mandibulates. E.g centipedes, millipedes and insects,chelicerate arthropods e g. scorpions and spiders. Echinodermata eg star fishes, Protochordates e.g. Tunicates

Chordates-general characteristics and diversity-fishes amphibians, reptiles, birds and mammals.

Course code: Zoo 102

Course Title: Introductory Zoology II

Course Outlines

Introductory Ecology: Introduction to concepts in ecology

Definition of ecology: the environment and climate; habit and niche; Autecolgy; Synecology ecosystem and communities, biomes, pollution and global warming. Introductory Genetics: Historical development of science of genetics, Life cycle and reproduction. Mendelian genetics. Chemical composition of the gene and molecular basis of heredity. Introductory physiology: nutrition, excretions, respiration and reproduction in animals, introductory Vertebrate Biology.

Course code: Zoo 103

Course Title: Experimental Zoology I

Course Outlines

General laboratory procedure: use and care of microscope: diversity of living things, plant cells, animal cells, animal embryology. eggs of chicken, starfish, toad.Animal classification, dissection of the earthworm, dissection of the toad.

Course code: Zoo 104

Course Title: Experimental Zoology II

Course Outlines

Concept and components of the environment, abiotic (temperature, water/humidity, topography etc) and biotic components, distibution of organisms in different habitats e.g, fresh water, ponds sow flowing streams, etc, determination of energy relationships, population/communities and ecosystems, Mendelian traits in fruitlies and human, population genetics, analysis of human bloods (MN, ABO, S &P);Diversity of the vertebrate group: Dissection of the toad, dissection of the lizard and dissection of the rat.

Course code: ZOO 201

Course Title: Principles of Animal Systematics

Course Outlines

Theories of biological classification and their history, Hierarchy of categories species' concepts methods of classification. Taxonomic characters and relationship

Pre-requisite: ZOO 101 (Introductory Zoology I). ZOO 102 (Introductory Zoology Il and Z00 103(Experimental Zoology).

Course code: ZOO 204

Course Title: Forms and Functions in Animals.

Course Outlines

Broad classification of Animal.

Animal form in relation to support and protection, locomotion, circulation, respiration nutrition, excretion, and homeostasis, reproduction, nervous and chemical coordination.

Course code: ZOO 301

Course Title: Comparative Animal Physiology.

Course Outlines

Regulation of salt and water in animals inhabiting marine, freshwater, brackish, estuarine and terrestrial environments

Nitrogen excretion: ammonotelic, uricotelic, and ureacotalic animals.

Respiratory and circulatory systems.

Feeding and digestion

Nutrition and intermediary metabolism.

Endocrine mechanisms

Muscle- nerve excitation.

Bioluminescence.

Chromatophores and colour change in animals.

Physiology of reproduction.

Course code: ZOO 302

Course Title: Entomology

Course Outlines

Methods and techniques in insect collections

Morphology (the integument, body regions head, thorax, abdomen and appendages.

Introductory internal anatomy

Reproduction and life cycle with reference to larva /nympha and pupal forms in insects

-Classification of insects, general/brief classification of arachnids and myriapods

Evolution or Arthropods. (Practical includes arthropods collection, identification and preparation for storage.

Course code: ZOO 304

Course Title: Animal Ecology.

Course Outlines

Aims and scope of ecology; Autecology and synecology

Concept and components of the environment, biotic and abiotic; the influence of the environmental factors on animals

Movement of environmental factors (temperature, relative humidity and moisture content evaporation, light, wind speed etc)

Sampling and collection methods in ecology, sampling and dispersions.

Methods of estimating density of animal populations

Vegetative zones of Nigeria: their climatic and edaphic features, their floral and faunal composition.

Animal association, introducing statistical methods in ecology-parametric and non-parametric tests.

Course code: ZOO 310

Course Title: Biology of Reproduction.

Course Outlines

Gametogenesis (hormonal control of sex cells), Egg types and cleavages. Early organization of a fertilized cell and epigenesist theory. Concept of development. Determination of primary organ rudiments in invertebrates (Amphioxus as a case study). Embryonic inductions in invertebrates.

Chick egg -mechanisms of formation of mesoblast. The neurula stage (amphibian and chick).

Interrelationship between tissues Organogesis."Reciprocity' in tissues interactions. Regeneration.

Embryonic adaptations and development of rabbit. Reproductive hormones.

Pre-requisite: Z00 204 (Form and Function in Animal).

Course code: ZOO 401

Course Title: Animal Behaviour.

Course Outlines

Reflexes and complex behaviour. The development of behaviour. External structure and sense

organs, Motivations: hormones and behaviour, instinct and learning. Behaviour and evolution.

Social life among animals.

Pre-requisite: ZOO 204 (Form and Functions in Animals)

Course code: ZOO 305

Course Title: Comparative Vertebrate Anatomy.

Course Outlines

A comparative and evolutionary study of skeletal, muscular, integumental, nervous, circulatory respiratory, digestive and reproductive systems, including excretory and sense organs of vertebrates. Geologic timescale, fossil studies, their importance in the study of comparative vertebrate anatomy

Pre-requisite: Z00 204 (Form and Functions in Animals

REFERENCES

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2. Botany A. Functional Approach by Walter H. Muller
3. Variety of Forms in the Plant Kingdom by Omotoye Olorode a nd H. C. Illoh.
4. Plant Physiology by S. N. Pandey and B. K. Sinha
5. Taxonomy of West African Flowening Plants by Omotoye Olonode
6. Plant Taxonomy by L.S. Gill
7. Plant Anatomy by Pijush Roy
8. Anatomy of Seed Plants by K. Esaw
9. Plaint Anatomy by Film
10. Introductory Genetics by Olonade and A. Adegoke
11. Claude A. Y. & Co Second Edition
12. Proceedings of the Second International Symposium on the Management of Large Rivers for Fisheries Vol 1. Edited by Rabin L Welcome and T. Petr.
13. Introduction to Botany by Murray Nabors
14. Introductory Botany by Linda R. Berg (Lab Manual)
15. Laboratory Manual for Botany by Margaret Balbach and Lawrence C. Bliss
16. Photo Atlas for Botany by James W. Perry & David Morton
17. Botany of Food by Mcg & Create
18. Botany Introduction to plant Biology by James D. Mauseth
19. A manual of practical zoology chordates
20. A manual of practical zoology invertebrates
21. Dr. P. S. Verma S-chard and company pvz Ltd
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