COURSE CODE: BIO 111

COURSE TITLE: Basic Principles of Biology

COURSE OUTLINE

Definition, brief history and importance of science

Scientific method:-

Identifying and defining problem.

Raising question, formulating Hypotheses. Designing experiments to test hypothesis, collecting data, analyzing data, drawing interference and conclusion.

Science processes/intellectual skills:

(a) Basic processes: observation, Classification, measurement etc

(b) Integrated processes:

Science of Biology and its subdivisions: Botany, Zoology, Biochemistry, Microbiology, Ecology, Entomology, Genetics, etc.

The Relevance of Biology to man: Application in conservation, agriculture, Public Health, Medical Sciences etc

Relation of Biology to other science subjects

Principles of classification

Brief history of classification nomenclature and systematic

The 5 kingdom system of classification

Living and non-living things: General characteristics of living things. Differences between plants and animals.

COURSE CODE: BIO 112

COURSE TITLE: Cell Biology

COURSE OUTLINE

(a) A brief history of the concept of cell and cell theory. The structure of a generalized plant cell and generalized animal cell, and their comparison Protoplasm and its properties. Cytoplasmic Organelles: Definition and functions of nucleus, endoplasmic reticulum, cell membrane, mitochondria, ribosomes, Golgi, complex, plastids, lysosomes and other cell organelles.

(b) Chemical constituents of cell - salts, carbohydrates, proteins, fats and oils, nucleic acid.

(c) Physical processes of cell: particle size, molecules and ions, suspensions, colloids and true solutions, properties of aqueous system; diffusion, osmosis, plasmolysis, turgor, pinocytosis, phagocytosis.

(d) Cell Division:

Mitosis and meiosis

Major stages of mitosis and meiosis

Comparison of the two divisions

Significance of mitosis and meiosis

COURSE CODE: BIO 113

COURSE TITLE: Diversity of Lower Plants

COURSE OUTLINE

(i) Viruses - Classification, size, structure, kinds, replication; role of diseases-human (e.g. STD, HIV-AIDS), plants and domestic animals e.g. (coccidiosis in poultry). Bacteriophages - structure and its biochemical activities.

(ii) Bacteria - General description: structure;, classification based on shape, mode of nutrition, types of flagella, mode of respiration and staining mechanism; life history; nutrition, role in diseases.

(iii) Fungi - General description, classification, and relationship with the environment. Study of various representatives of the Phycomycetes e.g Mucor, Rhizopus, Economic importance

(iv) Algae- Classification, range of forms i.e. solitary, colonial, filamentous, etc reproduction and economic importance of a named example.

(v) Lichens - An example of symbiotic relationship between fungi and algae, general description, classification and importance.

(vi) Bryophytes - Musci and Hepaticae. Treatment of each class using common examples in Nigeria – Perlia,Funnaria generations, habits, problems of the terrestrial environment as encountered by bryophytes in transition from water to land.

(vii) Pteridophytes – Classification, general description of various classes, alternation of generations. Structure, reproduction and habit of

Lycopodium,Sellaginella Drypopteris. Types of stele. Transitional position of pteridophytes among vascular plants.

COURSE CODE: BIO 114

COURSE TITLE: Biology Practical 1

COURSE OUTLINE

(i) Requirements for practical classes in biology
(ii) Examining biological specimens using hand lens
(iii) Rules for making biological drawings
(iv) The microscopes and their uses (including magnification)
(v) Data collection, analysis and presentation of results
(vi) Format for reporting observation in practical biology
(vii) Forms of practical examination in biology (observing and drawing specimens, performing or carrying out experiments, alternative to practical etc)
(viii) Sectioning and staining techniques
(ix) Slide preparation
(x) Principles and practice of sterilization
(xi) Culturing techniques for microscope organisms such as bacteria and fungi
(xii) Study of plant and animal cells using onion leaf, **Rheodiscolour** or similar plants (for plant cell)
(xiii) Practical study of mitosis and meiosis
(xiv) Experiments on plasmolysis, osmosis and diffusion
(xv) Preparation and observation of slides of Mucor and Rhizopus
(xvi) Observation, of slides of some pteridophytes
(xvii) Preparation and observation of slides of algae e.g Spirogyra, Euglena. Chlamydomonas etc
(xviii) Preparation and observation of slides of lichen showing various types and forms
(xix) Collection of Bryophytes and observation under the microscope
(xx) Dissection techniques, practice on dissection of toad and lizard (Agama)
(xxi) Use of dichotomous key to identify organisms

COURSE CODE: BIO 115

COURSE TITLE: Ecology

COURSE OUTLINE

Basic terms and concepts of Ecology-Autecology, syneeacology, environment, habitat, niche, ecosystem, adaptation, Ecological factors (their measurement and units in which the values are expressed), Soil studies - soil components soil properties, beneficial role of soil organisms, soil fertility and its loss, Soil in relation to plant and animal life, Aquatic habitats, terrestrial habitats - their nature, distribution, classification, environmental features, ecological hazards to life and adaptations of plants and animals in these habitats. Microhabitats: cracks on rock surfaces, tree crowns, soil litter on the ground, tree barks savannah micro-habitats: territorial.

COURSE CODE: BIO 121

COURSE TITLE: Diversity of Invertebrates

COURSE OUTLINE

Protozoa- General Characteristics

Mode of life and life cycle of Sarcodina e.g **Amoeba sp**

Mode of life and life cycle of Mastigophora e.g **Euglena**

Mode of life and life cycle of Sporozoa e.g **Plasmodium**

Mode of life and life cycle of Ciliata e.g **Paramecium**

Porrifera - Characteristics and structure of sponges

Coelenterate - General Characteristics of major classes

Mode of life and life cycle of Hydra and obelia

Platyhelminthes - General Characteristics

Mode of life and economic importance of

CLASS: Tubelaria e.g Planaria

CLASS: Trematoda e.g Fasciola

CLASS: Cestoda e.g Taenia

CLASS: Aphasmidia e.g Ascertidina

Nematode

Ascaris - mode of life and economic importance

Annelida

General Characteristics, mention of mode of life, and economic importance

CLASS: Oligochaeta - e.g Earthworms
CLASS: Polychaeta e.g Tuberworm/Sand/Lugworm
CLASS: Hirudinea - e.g leech
Arthropoda
General characteristics of the phylum.
External features of an example of each class:

- Crustacean
- Insecta
- Arachnida
- Myriapoda
- Chilopoda
- Diplopoda

General features, mode of life and life history of the following orders of the class insect: Diptera, Lepidoptera, Hemiptera, Hymnoptera.

Mollusca
General Characterístics
Brief classification and examples of each classes

ECHINODERMATA
General description. Link between invertebrates and chlordata.

COURSE CODE: BIO 122

COURSE TITLE: Diversity of Spermatophytes

COURSE OUTLINE

Introduction to, and general description of, spermatophytes and their subdivisions. General characteristics of gymnosperms and classification. Similarities and differences with higher cryptogams. Development of seed in gymnosperms and factors responsible for seed development. Structure and life-cycle of a conifer e.g Pinus. Development of embryo in gymnosperms.

Alternation of generation in plants. Characteristics of different angiosperm families. External morphology of angiosperm-stem; leaf, root and their modifications. Flower-concept of whorls, inflorescence and types. Pollination, fertilization, megasporogenesis and microsporogenesis, development of embryo in angiosperms. Seed and fruit formation. Fruits and their classification. Dispersal of fruit and seeds.

Importance of spermatophytes as sources of food, medicine, shelter, etc.

COURSE CODE: BIO 123

COURSE TITLE: Biology Methods 1

COURSE OUTLINE

Aims and Objectives of teaching Biology in Secondary Schools.
Syllabus, Scheme of work, lesson plan and lesson note.
Stating aims and instructional objectives in Biology.
Resources for teaching Biology
Improvisation in Biology teaching
Methods/strategies of teaching Biology e.g. discussion, lecture+, demonstration, small group approaches, activity approach, independent study etc. Evaluation of Biology outcomes: Cognitive: (memory, comprehension and application objectives). Affective: (interest, value, receiving, responding, valuing) psychomotor: how to use hand lens, microscope, etc (manipulative skills) Scientific attitudes - honesty, curiosity, critical/open mindedness etc
Micro-teaching.

COURSE CODE: BIO 125

COURSE TITLE: ECOLOGY 1

COURSE OUTLINE

Basic terms and concept of ecology – autecology, syncology, environment, habitat, niche, ecosystem, adaptation, ecological factors (their measurements and units in which the values are expressed).

Soil studies – soil components, soil properties, beneficial role of soil organisms, soil fertility and it loss. Soil in relation to plant life.

Soil as ecosystem: Aquatic habitats, terrestrial habitats – their nature, distribution, classification, environment features, ecological hazards to life and adaptations of plants and animal in these habitats.
Microhabitats: Cracks on rock surfaces, tree crowns, soil liter on the ground, tree barks, savannah micro-habitats: territeria.

COURSE CODE: BIO 124

COURSE TITLE: Biology Practical II

COURSE OUTLINE

Amoeba:

- Observation of slides of Amoeba with false feet (Pseudopodia), food vacuoles and contractile vacuoles

EUGLENA

- Make temporary slides of specimen collected from a slow flowing stream or pond to identify Euglena with flagellum
- Observe permanent slide of Euglena and study the physical appearance

Paramecium

- Observe the slide of Parameccium to identify the structure (shape, cilia, mega nucleus, micronucleus, star-shaped to contractile vacuole, food vacuole).

Hydra

- Identify the tentacles, hypostome (mouth), two body walls –Ectoderm and Endoderm separated by mesoglea
- Observe L/S of the body wall.

Planaria

- T.S slide of Planaria to show the three layers or body walls - (ectoderm mesoderm, endoderm)

Taenia

- Observe slide to Taenia showing suckers and segmentation

Lumbricus (Earthwornm

- Collect living earthworms and study the physical appearance
- Observe the T.S of earthworm

Acatina

- Collect and observe the general appearance of snail

Crustacea

- Collect and study the structure of crayfish or any the suitable crustacean.

Myriapoda

- Study the physical appearance of centipedes and millipedes (note many legs of the myriapode)
- Draw and label (use preserved specimen or freshly killed) specimen in chloroform.

Arachnida

- Study the physical appearance of Spider: Note two body divisions, four pairs of legs.

Insecta:

Study the appearance of cockroach - a representative of insect

Note three body divisions, three pairs of jointed legs, two pairs of wings

Note position of wings on thorax (meso and meta thorax)

Note segmented abdomen and spiracles on abdominal segments

Study mouth parts of these insects:

Dipteria: (Housefly, Mosquitoes)

Hymenoptera: (bees, ants)

Lepidoptera: (butterfly and moth)

Diversity of Spermatophytes

- External morphology of typical Gymnosperm and Angiosperm

- Preparations of Keys for identifying Angiosperm.

- Flowers and inflorescence

- Study placentation of seed in fruits, types of fruits, and adaptation for dispersal.

- Habitat Studies: on suitable aquatic and terrestrial environment on habitats.

Echinodermata

- Collect and study general external features of star fish

Ecology

- Habitat studies: on suitable aquatic and terrestrial environment
- Mini project on specific habitat study
- Measurement of physical factors e.g. Temperature, Light intensity, humidity, wind direction and speed, dissolved ages turbidity, depth speed of flow PH in relevant habitats.
- Edaphic factors - soil porosity, water holding capacity, soil texture, PH percentage humus, and land slope, soil temperature at various depths and time.

COURSE CODE: BIO 211

COURSE TITLE: Diversity of Chordates

COURSE OUTLINE

(a) General Characteristics of Chordates

(b) Classification and general distinguishing characteristics of

(i) Sub phyla protochordata and vertebrata

(ii) Super classes Agnatha and Gnathostomata

(iii) Agnatha - Class Cyclostomata

(iv) Gnathstomata - Classes: Pisces, Amphibia, Reptilian , Aves and Mammalian

(a) Evolutionary advancement, adaptive radiation, success and special features of interest in the various groups

(b) (i) The transition from water to land and the problem of land life in amphibians

(ii) The development of the cleidoic egg in the Amniota.

(iii) The dominance of mammals over other chordates.

COURSE CODE: BIO 212

COURSE TITLE: Research Methods and Biometry

COURSE OUTLINE

- Meaning, Purpose and relevance of Research and Biometry
- Types of Research (Experimental, Survey, Case Study etc.)
- Choice of Research Topic
- Hypothesis (Types, Source, Formulation)
- Data Collection (Types and Sources)
- Population, Sample and Sampling technique
- Data Presentation: Frequency Distribution, Cumulative frequency, graphs (line, histograms).
- Bar Charts, Pie Charts etc.
- Measures of Central tendency (Mean and Median)
- Measures of Dispersion (Mean Deviation, variance and standard Deviation)
- Measures of Relationship (Chi-square (x2) correlation Coefficient, T-test and ANOVA)
- Project Reporting

COURSE CODE: BIO 213

COURSE TITLE: Population Education

COURSE OUTLINE

World Human Population Growth and problems

- Factors accounting for population growth (causes of population change in Nigeria e.g. socio-culture practices and religious beliefs.
- Population policies and strategies
- Methods and problems of estimating human population (e g. school community) and interpretation of results.
- Population and development of resources
- Solution to problems of population growth
- Birth control measures involving male and female reproductive organs controversies and consequences. Reproductive behavior (e.g early marriage, premarital sex, teenage pregnancy) -consequences.
- Biological, psychological, social and economic readiness of male and female for reproduction.
- Ethical implication of biotechnology.

COURSE CODE: BIO 214

COURSE TITLE: Plant Pathology

COURSE OUTLINE

- Meaning of plant pathology and pathogenicity.
- Plant pathology as it affects food production and quality of life.
- Differences between diseases, parasites and pests.
- Classes of diseases, modes of transmission of pathogens.
- Entry of pathogens in tissues of hosts.
- Diseases enhanced by abiotic factors such as adverse weather conditions and mineral deficiencies.
- Phenomenon of infection and factors influencing it Features of the major groups of plant pathology (viruses, algae, fungi bacteria, worms and nematodes)
- Disease of food crops such as maize, yam, cassava, rice, tomatoes and any other suitable food crops.
- Biology and control of diseases, a few selected diseases (biological control)
- Diseases of cash crops such as tobacco, groundnut, oil palm and any other suitable cash crop.

COURSE CODE: BIO 215

COURSE TITLE: Animal Histology

COURSE OUTLINE

- History of various tissues should be studied e.g. Epithelia, Connective tissue, Muscular Tissue
- **History of the following organs:** Skin, Liver, Kidney, Ovary and testis
- **History of the following:** Blood, Bones, Cartilages, Muscles,Nerves.

COURSE CODE: BIO 216

COURSE TITLE: Practical lll

COURSE OUTLINE

Anatomy and Histology of Plants

- Preparation of temporary slides for T.S. of root, stem and leaf of monocots and dicots
- Observation of permanent slides of root, stem and leaf of dicots and monocots field observation of Primary and Secondary Thickening

Diversity of Chordates

- Observation of living forms of fishes (bony and cartilaginous e.g **Tilapia** and dogfish), observation of Primary and Secondary thickening
- Observation of living forms of birds (Aves) e g pigeon/chicken for external and adaptive features in flight.
- Examination of the various types of mammals Observation of living and preserved specimens of mammals

COURSE CODE: BIO 221

COURSE TITLE: Plant Physiology

COURSE OUTLINE

Water Relations: Absorption of water, Transpiration in details

Mineral Nutrition in plant

The various mineral requirements of plants: sources and roles of each mineral element (including treace elements in plant metabolism, Nutrient deficiency diseases in plants.

Photosynthesis

Plants as primary producers of food for populations. General description of the process. Raw materials and products of photosynthesis Mechanism of photosynthesis, chloroplast as the site for photosynthesis. light reaction conversion of light energy into energy, photochemical splitting of water, Calvin cycle. Dark reaction.

Translocation of manufactured food. Reduction of nitrate and production of amino acids

Respiration

General description of aerobic and anaerobic respiration in plants.

Growth and movements

Growth of plants in length, and its measurement. Movement in plants e.g trpism, taxism and nastism

Excretion in plants

Excretion materials and their removal from the plant body.

COURSE CODE: BIO 222

COURSE TITLE: Vertebrate Anatomy And Physiology

COURSE OUTLINE

Vertebrate Anatomy

- Meaning, scope and description of vertebrate anatomy and physiology
- Study of the following systems in mammals and amphibians
- Digestive system
- Circulatory system
- Respiratory system
- Compares male and female reproductive organs of human being
- Nervous system
- Skeletal system

Nutrition: Meaning of nutrition, components of food and balanced diet, mineral requirement in animal

Digestive System and Digestive in Mammals and Amphibians

- Function of liver with emphasis on deamination

Enzymes

- Definition and nature of enzymes
- Main categories of enzymes and the system of naming them
- Factors affecting enzyme activity and the mechanism of enzyme action
- Co-enzymes and Prosthetic groups

The Circulatory System

- Blood circulation and control of heart beat.
- Blood transfusion, body resistance and AIDS
- Structure and functions of the circulatory system
- Structure and functions of blood, mechanism of blood clotting
- Importance of blood screening g (to detect cancer, malaria parasites hepatitis, leukaemia etc)

Respiratory System and Respiration

- Structure and functions of respiratory system
- Mechanism of inhalation and exhalation; aerobic and anaerobic respiration, glycolysis and the Kreb's cycle..

Excretion

- The need for excretion and major metabolic wastes in vertebrates
- Excretory organs and their functions (the skin, lungs, kidneys)Processes of excretion (nitrogenous and gaseous excretion)

Nervous System and Co-ordination)

- Structure and functions of the central and peripheral nervous system
- Functions of a nerve cell, nerve impulse, synapse, nervous control and coordination
- Nervous integration, description of the reflex arc
- Sense organs - eye, ear, skin, tongue, nose etc.

Skeletal and Muscular Systems

- Structure and functions of mammalian skeleton. Mechanism of muscular contraction

Hormonal Co-ordination

- Meaning, properties and functions of hormones, the pituitary and tropic
- Hormones (their sources and effects in the body)
- Thyroxin, adrenalin and hormones of the reproductive system (their glands effects in the body)

Reproductive System And Reproduction

Structure and functions of the male and female reproductive systems in mammals Fertilization, gestation and birth in a named mammal. A brief mention of menstrual cycle in needed.

COURSE CODE: BIO 223

COURSE TITLE: Embryology

COURSE OUTLINE

- The concept of embryology
- Functional processes in embryonic development: determination differentiation, morphogenesis (growth and organogenesis), Gametogenesis (spermatogenesis and exogenesis).
- The structure of spermatozoa and egg cell of a named mammal at the time of fertilization.
- The meaning stages, characteristics, types and significance of eleavage
- Outline of the development of a fertilized ovule and the production of seed and fruit in a dicotyledonous plants
- An outline of the development of an amphibian (frog or toad) or bird to the neurula stage only
- Embryonic membranes in birds and mammals
- Functions of the placenta in birds and mammals
- Gestation and abortion; birth in mammals.

COURSE CODE: BIO 224

COURSE TITLE: Biology Practical IV

COURSE OUTLINE

- Experiments to demonstrate that Chlorophyll light and cabondioxide are necessary for photosynthesis.
- Experiments to show that starch and oxygen are products of photosynthesis
- Experiments to show tropisms in plants
- Examination of various excretory products from plants e.g. train resins and salts, etc
- Experiments on Transpiration to show:
- Evidence of transpiration in plants
- Rate of transpiration
- Factors affecting transpiration rates
- Study of slides in spermatogenesis and oogenesis
- Gross and microscope structures of the kidney
- Slides of various tissues should be examined under strict supervision and guidance of the teacher.
- Examination of slides of various organs.
- Population studies using sampling techniques.
- Observation of succession in the suitable habitat e.g plant succession
- Identification of diseases associated with cash crops mentioned in the syllabus. Interpretation of data, where available, on distribution of plant diseases and STDs/AIDS in Nigeria.
- Dentition in herbivores, carnivores and omnivores compared
- Enzymes action of food substance, e.g. action of salivary amylase on starch
- Factors affecting enzyme action
- Measurement of heart beat and effective of exercise on heart beat
- Measurement of breathing rate and effect of exercise on breathing rate
- Determination of various taste sites on the tongue Determination of the blind spot on the eye
- Effect of sight on balancing
- Dissection of mammal showing the location of various organs and system
- Digestive system
- Respiratory system
- Excretory system
- Circulatory system
- Reproduction system
- The system above could also be shown in the frog/toad for comparison.

- The planning of a biology laboratory
- Location, size, height, spacing and facilities such as windows, doors
- Lighting and other fitting like cupboard and working benches
- Ordering of equipment.
- Inventory, care and maintenance of the equipment
- Common accidents in the Laboratory-fire, acid & alkaline burns, animal bites, stings, inhalation of dangerous gases, cuts, electrical shocks etc.
- Safety in the laboratory
- Safety devices such as fire-extinguisher, fire blankets and bucket.
- First aid: (first aid kit, first aid measures)
- Knowledge of electrical wiring in the laboratory: fuses, bulbs and fluorescent tubes
- Improvisation in biology laboratory: importance of local production, basic skills in improvisation and local production of local production, Basic skills in improvisation and local production in wood work, glassblowing brick laying. metal and electrical/electronics, such skills should be usable in construction simple biological equipment.
- Biological garden and outdoor laboratory
- Setting up of a school biological museum and preparation of museum materials, preservation, display etc. (Taxidermy)
- The herbarium-construction and setting up of a herbarium

BIO 321 Laboratory management

- The Planning of a biology laboratory
- Location, size, height, spacing and facilities such as windows, doors
- Lighting and other fitting like cupboard and working benches
- Ordering of equipment
- Inventory, care and maintenance of the equipment
- Common accidents in the Laboratory-fire, acid & alkaline burns, stings inhalation of dangerous gases, cuts electrical shocks etc.
- Safety in the laboratory
- Safety devices such as fire-extinguisher, fire blankets and bucket
- First aid (first and kit, first aid measures)
- Knowledge of electrical wiring in the laboratory-fuses, bulbs and fluorescent tubes
- Improvisation in biology laboratory-importance of local production, basic skills in improvisation and local production of local production
- Basic skills in improvisation and local production in wood work, glassblowing, brick laying, metal and electrical/electronics, such skills should be usable in construction simple biological equipment.
- Biological garden and outdoor laboratory
- Settling up of a school biological museum and preparation of museum materials, preservation, display etc. (Taxidermy)
- The herbarium-construction and setting up of a herbarium

BIO 322 Applied Biology

Man's Diseases and Health

Disease - meaning, common tropical disease, their causes, cure and prevention. Effect of parasites on man e g. malaria parasite, sleeping sickness parasite etc. Public health and roles of voluntary and international organizations in health control.

Social and health problems of Tobacco consumption and the effect of smoking on the body; Drugs, their uses and abuse (mentioned use of cocaine, hemp and other dangerous drugs)

Family life education, Sexually transmitted diseases/HIV-AIDS

Other social problems such as; prostitution, sex abuse and effects on human health and productivity.

Ecological Consequences of Agriculture

Relationship between monoculture and spread of plant diseases and pests Ecological effects of herbicides, pesticides and chemical fertilizers.

Ecological Consequences of Urbanization and industrialization

Overpopulation and pressure social amenities e.g. transportation and housing, undesirable social habits such as delinquency, truancy, prostitution, pollution, conflict in land use

- Solution to problems of population growth
- Birth control measures.
- Reproductive behaviour e.g. early marriage, pre-marital sex, teenage pregnancy, abortion, their prevention and control, Population education in Biology
- Preparation of charts and posters on core messages/slogans of effects of uncontrolled population.

Effects of Man on his Environment

Effects of man on vegetation, atmosphere, soils water and water resources, other natural resources.

Pollution: Definition types of pollution (air pollution, water pollution, land pollution), Curses of pollution, Effect of pollution (effects of air pollution, water pollution and land pollution), Control of pollution.

N.B Special mention should be made to sewage and other forms of urban pollution e.g noise, radiation and ocean pollution, unburnt gases or smokes from motor cars exhaust pipes or motorcycle silencer.

Conservation of Natural Resources

- Wildife, minerals, forest, soil, water, atmosphere, fuel (e.g. crude oil)

Methods of conservation and preservation of these resources.

Field Trips

Field Trips to game reserves to study rare species in their natural habitats, Visit to areas of gully and sheet erosion.

Visit to notable areas of pollution e.g. polluted treams, mechanic workshops.

etc and observe pollution. Watch films on polluted habitats.

N.B. Field trip/Excursion to game reserves or major areas of biological importance is compulsory. Its report is to be presented for accreditation purpose and should form a minimum of 20% of this course.

BIO 323 Introductory Parastology

Meaning and scope of Parasitology

Parasitism: different types of parasitic relationships between organisms e.g obligate, facultative, parasitic adaptation including change of antigenic Structure as in the AIDs virus (HIV)

Adaptation involving in parasitic mode of life and transmission of STDs/AIDS Parasitic mode of life of the following:

Entamoeba spp. Malaria parasites, (Plasmodium spp.) Life cycle and control Trypanosome spp. Life cycle and control

Trichomonas vaginalis lifecycle, cure and control

Helminthes such as Fasciola hepatica: Schistosoma spp

Nematodes such as Ascaris spp

Hookworms such as Ancyclostoma duodenale, Wuchereria bancrfti

(Note All these organisms' life cycle, cure and control are expected to be treated)

- Plant parasitic nematodes
- Parasitic insects (Structure, adaptive teatures and control)

- Heredity and Environment:
- Mendel's work on peas. Meaning of basic genetical terms (genotype, homozygous, heterozygous, alleles, etc). Mono and dihybird crosses. Concept of dominance, incomplete dominance.
- The chromosome theory of inheritance and the gene hypothesis, nucleus acid, DNA geneticcode. Salivary gland chromosomes. RNA protein synthesis formation of amino acid and lipoproteins.
- Sex chromosomes, autosomes, sex determination and linkage
- Mutations: lethal mutations, polyploidy: Examples of new varieties of plants and animals arising by mutation and polyploidy: production of mutations by radiation and other means.
- Human heredity e.g. colour blindness, paternity, blood group, haemophilia.
- Problems in family that relate sex determination, intelligence membership resemblance and diseases
- Genetic Counseling on family characteristic e.g. blood groups, blood types and sickle cell anaemia
- Applied genetics: in agriculture, medicine etc.

- Examination of any fossil material, if available
- Excursion to zoological garden to study evolution trend among animals

Parasitology

- Observation of slides of Plasmodium, Trypanosome, Taenia, Fasciola, Ascaris, Ancyclostoma, Witchereria etc
- Observe sterilization techniques in hospitals especially with reference to prevention of HIV infection.
- Observation of structure and adaptive features of some parasitic insects and arachnids e.g. Bed bugs, lice, ticks.

Applied Biology

- Study of population growth in Nigeria
- Town ecology i.e. measurement of pollutant e.g. Co2, CO, SO2 at various site in a town.
- Use of lower plants e.g. lichens and mosses as indicators of pollution level
- Pollutants in a stream e.g. detergents, fertilizer, chemical containers,dyes
- Effects of various fertilizers and herbicides as pollutants in aquatic habitat on biotic community
- Estimation of population (school or college)
- Excursion to National Park, Lakes and areas of apparent gully erosion.

Genetics

- Examination of models/charts to illustrate monohybrid and dihybrid crosses in plants and animals
- Observation of various (height, weight, finger prints, tongue rolling etc)
- Microscope examination of the squashed testes of grasshopper or pollen grains for meiosis, other suitable experiments on monohybrid crosses in using suitable plant and animal materials such as maize, guinea pigs and beans
- Culturing of fruit fly-Drosophila Melanogaster

Laboratory Management

- Students should be guided to practice ordering of equipment for the laboratory.
- Students should be familiar with safety and first aid devices in the laboratory
- Students should carry out exercises on handling glass wares and chemicals, electrical wiring and fuses.
- Observation should be guided to construct biological material the can be used in the laboratory i.e. improvisation e.g. test-tubes, beakers specimen bottles, etc
- Preparation of specimens such as herbarium, skeletons, stuffed material etc.
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