AJETUNMOBI COLLEGE OF EDUCATION
SCHOOL OF SCIENCES
SECOND SEMESTER COURSE ALLOCATION

S/N	COURSE CODE	COURSE TITLE	UNIT	LECTURER-IN-CHARGE	
1	BIO 121	DIVERSITY OF INVERTEBRATES	1	BAMIDELE	08032607081
2	BIO 122	DIVERSITY, ANATOMY AND HISTOLOGY OF SPERMATOPHYTES	1	SODIQ	08101295250
3	BIO 123	BIOLOGY METHODS	2	ADEBISI	08033808794
4	BIO 124	BIOLOGY PRACTICAL II	1	ADEBISI	08033808794
5	BIO 221	PLANT PHYSIOLOGY	1	BAMIDELE	08032607081
6	BIO 222	ANATOMY, HISTOLOGY& PHYSIOLOGY OF VERTEBRATES	2	SODIQ	08101295250
7	BIO 223	EMBRYOLOGY	1	BAMIDELE	08032607081
8	BIO 224	BIOLOGY PRACTICAL IV	1	ADEBISI	08033808794
9	CSC 121	INTRODUCTION TO MICRO PROCESSOR	1	MUFUTAU	09046047276
10	CSC 122	APPLICATION PACKAGES (MS WORD, MS EXCEL & MS POWER POINT)	1	MUFUTAU	09046047276
11	CSC 123	COMPUTER MAINTENANCE / TROUBLESHOOTING	1	MUFTAU	09046047276
12	CSC 124	THE TEACHING OF COMPUTER SCIENCE	1	ZAKARIYAH	08032836248
13	CSC 221	INTRODUCTION TO WEB DESIGN & DEVELOPMENT (HTML & CSS)	1	HAMZAT	08068901902
14	CSC 222	OPERATING SYSTEMS	1	MUFUTAU	09046047276
15	CSC 223	INTRODUCTION TO NUMERICAL METHODS	1	HAMZAT	08068901902
16	CSC 224	SIWES	1	DONE	
17	CSC 225	SYSTEM ANALYSIS AND DESIGN	1	ADEBIYI	08065600838
18	ISC121	MATHEMATICS FOR SCIENCE II	1	ADENEKAN	08034072716
19	ISC122	PROCESSES OF LIFE	1	SODIQ	08101295250
20	ISC123	MAN AND ENERGY I	2	BAMIDELE	08032607081
21	ISC 221	NATURE OF MATTER II	1	SODIQ	08101295250
22	ISC 222	SCIENCE EDUCATION III	1	ADEBISI	08033808794
23	ISC 223	DYNAMICS	1	ADENEKAN	08034072716
24	ISC 224	Research method	1	Combined	
25	ISC 225	CARBON COMPOUND I	1	SODIQ	08101295250

BIO 121 DIVERSITY OF INVERTEBRATES 1 Credit Compulsory

Objectives

At the end of the course, students should be able to:

a. State the general characteristics of protozoa, porifera Platyhelminthes, nematodes, mollusks and the echinoderms

b. Describe the life cycle of protozoa porifera coelenterate Platyhelminthes, nematodes etc.

Topics

- General Characteristics of protozoa
- 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
- Characteristics and structure of sponges
- General Characteristics of major classes of coelenterate
- Mode of life and life cycle of Hydra and Obelia
- General Characteristics of Platyhelminthes
- Mode of life and economic importance of Turbellaria e.g. Planaria, Trematoda e.g. Fasciola, :Cestoda e.g. Taenia, Aphasmidia e.g. Ascertidina, Ascaris - mode of life and economic importance of Annelida, General Characteristics, mention of mode of life, and economic importance, Oligochaeta - e.g. Earthworms, Polychaeta e.g. Tubeworm/Sand/Lugworm, Hirudinea– e.g. leech,
- General characteristics of the phylum Arthropoda**,** External features of an example of each class, Crustacea, Insecta, Arachnida, Myriapoda, hilopoda, Diplopoda
- General features, mode of life and life history of the following orders of the class Insecta: Diptera, Lepidoptera, Hemiptera, Hymnopteraetc
- General Characteristics of Mollusca**,** Brief classification and examples of each class.
- General description of Echinodermata, Link between invertebrates and Chordata.

BIO 122 DIVERSITY, ANATOMY AND HISTOLOGY OF SPERMATOPHYTES
2 Credits Compulsory

Objectives

At the end of the course, students should be able to:

a. Outline the general characteristics gymnosperms, conifer and angiosperm
b. Describe the morphology/physiology of angiosperm – stem, leaf, root and their modifications
c. Describe the different types of tissues and their functions

Topics

- 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, mega-sporogenesis and microsporogenesis,
- Development of embryo in angiosperms.
- Seed and fruit formation.

- Fruits and their classification.
- Dispersal of fruits and seeds.
- Importance of spermatophytes as sources of food, medicine, shelter, etc.

BIO 123 BIOLOGY METHODS 1 Credit Compulsory

Objectives

At the end of the course, students should be able to

a. State the Aims and objectives of teaching biology in Secondary Schools
b. List the resources/strategies used in teaching biology.
c. Identify relevant evaluation techniques as it affects the three domains in the teaching and learning of biology.

Topics

- 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, Lecturer, demonstration, small group approaches, activity approach, independent study etc.
- Evaluation of Biology learning 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
- Further strategies in biology teaching: questioning, inquiry, discovery, fieldtrips, use of resource persons, tours and excursions, projects etc.
- Classroom management.
- Evaluation in biology i.e. types of tests and test construction in biology.
- Developing tests at the cognitive (all the six levels), Affective and psychomotor domains.
- Development organization and characterization of test items.
- Further micro-teaching with emphasis on the importance of teaching aids
- Practical work on improvisation of teaching aids in biology equipment and materials (models, charts, mockups, etc).
- Preparation of charts and posters on core message of Population/Family life education and Sexually Transmitted diseases (STD)/AIDS.

BIO 124 BIOLOGY PRACTICALS II 1 Credit Compulsory

Objectives

At the end of the course, students should be able to:

a. Observe, draw, label amoeba, Euglena, paramecium, Hydra, planaria, taenia, class insect, typical gymnosperm and angiosperm
b. Measure various factors of Ecosystem

Topics:

- 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.
- Observation of slides of Amoeba with false feet (Pseudopodia), food vacuoles and contractile vacuoles
- 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
- Observe the slide of Paramecium to identify the structure (shape, cilia, mega nucleus, micronucleus, star-shaped to contractile vacuole, food vacuole).
- Identify the tentacles, hypostome (mouth), two body walls– Ectoderm and Endoderm separated by mesoglea of hydra
- Observe L/S of the body wall of hydra.
- T.S. slide of Planaria to show the three layers or body walls – (ectoderm mesoderm, endoderm)
- Observe slide to Taenia showing suckers and segmentation
- Collect living earthworms and study the physical appearance
- Observe the T.S. of earthworm
- Collect and observe the general appearance of snail.
- Collect and study the structure of crayfish or any other suitable crustacean
- 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.
- Study the physical appearance of Spider: Note two body divisions, four pairs of legs
- Study the appearance of cockroach – a representative of insect
- Study mouth parts of these insects-Dipteria (Housefly, Mosquitoes), Hymenoptera: (bees, ants), Lepidoptera (butterfly and moth)
- External morphology of typical Gymnosperm and Angiosperm
- Preparations of Keys for identifying Angiosperms
- Flowers and inflorescence
- Study placentation of seed in fruits, types of fruits and adaptation for dispersal
- Collect and study general external features of star fish
- Habitat studies: on suitable aquatic and terrestrial environments
- 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.

BIO 221 PLANT PHYSIOLOGY 2 Credits Compulsory

Objective

At the end of the course, students should be able to explain basic physiological processes in plants

- Plant absorption of water
- Plant Transpiration
- The various mineral requirements of plants-sources and roles of each mineral element (including trace elements) in plant metabolism, Nutrient deficiency diseases in plants etc.
- Plants as Primary producers of food for populations
- General description of food chain
- 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 nitrates and production of amino acids.
- General description of aerobic and anaerobic respiration in plants.
- Growth of plants in length, and its measurement
- Movement in plants e.g. tropism, taxism and nastism
- Excretion materials and their removal from the plant body.

BIO 222 VERTEBRATE ANATOMY, HISTOLOGY AND PHYSIOLOGY 2 Credits

Objectives:

At the end of the course, students should be able to:

a. explain the various systems of the body.

b. Describe the functions of the various systems.

- Meaning, scope and description of vertebrate anatomy and physiology
- Study of the following systems in mammals and amphibians
- Digestive system
- Circulatory system
- Respiratory system
- Compare male and female reproductive organs of human being
- Nervous system
- Skeletal system
- Meaning of nutrition, components of food and balanced diet, mineral requirement in animal.
- Digestive System and Digestion in Mammals and Amphibians
- Function of liver with emphasis on deamination
- 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.
- Structure and functions of the circulatory system
- Blood circulation and control of heart beat.
- Structure and functions of blood, mechanism of blood clotting
- Blood transfusion, body resistance and AIDS
- Importance of blood screening (to detect cancer, malaria parasites hepatitis, leukemia etc.)
- Structure and functions of respiratory system
- Mechanism of inhalation and exhalation; aerobic and anaerobic respiration, glycolysis and the Kreb's cycle.
- Significance of respiration.
- 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)
- 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.
- Structure and functions of mammalian skeleton. Mechanism of muscular contraction.
- 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 and effects in the body).
- 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 is needed.

BIO 223 EMBRYOLOGY 1 Credit Elective

Objectives

At the end of the course, students should be able to:

a. Describe the developmental stages of an organism

b. Explain the process involved in gestation in mammals.

- The concept of embryology
- Fundamental processes in embryonic development- Determination, differentiation, morphogenesis (growth and organogenesis), Gametogenesis (spermatogenesis and oogenesis).
- The structure of spermatozoa and egg cell of a named mammal at the time of fertilization.
- The meaning stages, characteristics, types and significance of cleavage
- Outline of the development of a fertilized ovule and the production of seed and fruit in a dicotyledonous plant
- 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.

BIO 224 BIOLOGY PRACTICALS IV 1 Credit Compulsory

Objectives

At the end of the course, students should be able to conduct experiments to:

- demonstrate that Chlorophyll light and cabondioxide, are necessary for photosynthesis.
- show that starch and oxygen are products of photosynthesis
- show tropisms in plants
- Examine various excretory products from plants e.g. trains gums, resins and salts, etc.
- show evidence of transpiration in plants
- show rate of transpiration in plants

Topics

- Factors affecting transpiration rates.
- Study spermatogenesis and oogenesis.
- Gross and microscopic 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
- Enzyme action of food substances, e.g. action of salivary amylase on starch.
- Factors affecting enzyme action
- Measurement of heartbeat and effect of exercise on heartbeat.
- 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 mammals showing the location of various organs and system.

- Digestive system
- Respiratory system
- Excretory system
- Circulatory system
- Reproductive system
- The system above could also be shown in the frog/toad for comparison.

CSC 121 – INTRODUCTION TO COMPUTER SCIENCE (1 Credit; Core)

- Concept of Microprocessor
- Internal structure and basic operation of Microprocessor
- Types of Microprocessor

CSC 122 – COMPUTER APPLICATION PACKAGES (1 Credit; Core)

- Overview of Application Packages
- Use of Microsoft Word Packages
- Use of Electronic Spreadsheet (Microsoft Excel)
- Use of Presentation Packages (Microsoft PowerPoint)

CSC 123 – COMPUTER MAINTENACE/TROUBLESHOOTING (1 Credit; Core)

- Basic concept of Computer upgrading and maintenance for PC
- PC limitation and scope for upgrading
- Technical specification for PC upgrading
- Solution to common Computer problems
- Computer system troubleshooting

CSC 124 – THE TEACHING OF COMPUTER SCIENCE (1 Credit; Core)

- Introduction to teaching profession
- Teaching methods and strategies
- Effective integration to teaching methods, strategies and technology in instructional delivery of Computer studies

CSC 221 – INTRODUCTION TO WEB DESIGN AND DEVELOPMENT (HTML & CSS) (1 Credit; Core)

- Concept of Web Design (HTML and CSS)
- Application of Hypertext Markup Language (HTML)
- Concept of Cascading Style Sheet (CSS)
- Design of HTML table and Links

CSC 222 – OPERATING SYSTEM (1 Credit; Core)

- An overview of Operating System-Definition,Types,Uses, Advantages and disadvantages
- Components of Operating System-Assemblers, Compilers and Interpreters
- Batch processing, Real time processing, Time sharing and Multi-processing
- Allocation and scheduling resources
- Operating System Nucleus and Memory management

- Input/output system
- Intensive practice using available Operating System – emphasis on Windows OS

CSC 223 – INTRODUCTION TO NUMERICAL METHOD S (1 Credit; Core)

- Listing of Numeric methods
- Methods of interpolation
- Halving the square method
- Newton-Raphson method
- Trapezoidal method
- Gaussian method
- Using Computer for treating the above

CSC 225 – SYSTEMS ANALYSIS AND DESIGN (1 Credit; Core)

- Concept of Systems Analysis and Design
- Stages of Systems Analysis and Design
- System Development Life Cycle
- Techniques of systems Analysis and Design
- Man- Management Information system (MIS): Concept, levels and tools

ISC 121 Mathematics for Science I 1 Credit (2 hours/week) Compulsory

- Graphs and Forms
- Variables and Scales for graph plotting.
- Slope and intercept on a linear graph;
- Standard linear form $y = m x + c$
- Forms of common plots such as $\frac{1}{x}$, x^2, $\frac{1}{x^2}$, sinx, cosx, e^{nx}, Sinx, Cosx.
- Slope of a tangent to a curve as a means of obtaining gradient.
- Geometry and Trigonometry
- $\frac{d}{dx}$ For a rate of change with respect to variable x.
- Area below a curve and relate this to integration
- Histograph plots,
- Simple harmonic motion

ISC 122 Processes of Life 1 Credits Compulsory

- Photosynthesis
- Test leaves and storage organs for starch.
- Combustion and respiration.
- Oxidation and reduction
- Respiration
- Energy change during the burning of food
- Respiratory System and problems connected to breathing
- Nutrition (classes, sources and importance of nutrients)
- Interrelationship between population, personal health and nutrition

- Digestive system
- Absorption of food and simple food test.
- Food storage
- Circulatory system
- Excretory system
- Nervous system
- Skeletal system

ISC 123 Man and Energy I 2 Credits, (4 Hours/Week) Compulsory

- Force,
- Work done
- Energy (Forms of Energy)
- Transfer of energy
- Renewable and non-renewable energy.
- Conservation of Energy
- Temperature
- Celsius and Kelvin temperature scales- and the concept of absolute zero of temperature.
- Heat
- Heat transfer by conduction, convection and radiation.
- Light (propagation, shadows and eclipse0
- Laws of reflection.
- Image formed by a plane mirror
- Uses of convex and concave mirrors
- Sound waves longitudinal waves
- Velocity of sound in air
- Factors which cause changes in the frequency of sounds
- Pitch of a sound

ISC 221 Nature of Matter II 1 Credit (2 hours/week) Compulsory

- Atomic Structure
- Periodic Table
- Physical and Chemical Changes
- Separation Techniques
- Transition Elements and their Properties
- Reactions of Some Ions
- Volumetric Analysis

ISC222 Science Education II 2 Credits (4hours/week) Compulsory

- Developing a course
- Developing a lesson
- Mixed ability groups
- Special educational needs (care)
- Board work
- Demonstration method
- Practical activities
- Discussions method
- Teaching/learning aids.
- Purposes of assessment
- Different modes of writing questions

- Preparing marking schemes
- Evaluation of classroom activities and end of course performance.
- Micro-Teaching

ISC223 Dynamics 1 Credit (2 Hours/Week) Compulsory

- Speed
- Acceleration
- Speed/Time Graph for Linear Motion
- Newton's Law of Motion
- Gravitational Force
- Concept and Purpose of Space Travels.
- Satellite and Its uses in the Society
- Momentum
- Conservation of Linear Momentum.
- Motion in a Circle
- Simple Harmonic Motion

ISC 224: Research Method 1 Credit (2Hours/Week) Compulsory

- Research (Meaning, types and importance)
- Identifying the topics
- Topic selection
- Literature Review
- Construction of instruments
- Data Analysis
- Project reports

ISC 225 Carbon Compounds I 1 Credit (2 hours/week) Compulsory

- Introduction to Carbon Chemistry
- Catenation Of Carbon
- Aliphatic Hydrocarbons
- Crude Oil
- Refining crude oil, its uses and its economic importance
- Cracking
- Octane number of a fuel
- Coal
- Resource management and national wealth
- Mineral exploration
- Pollution management.