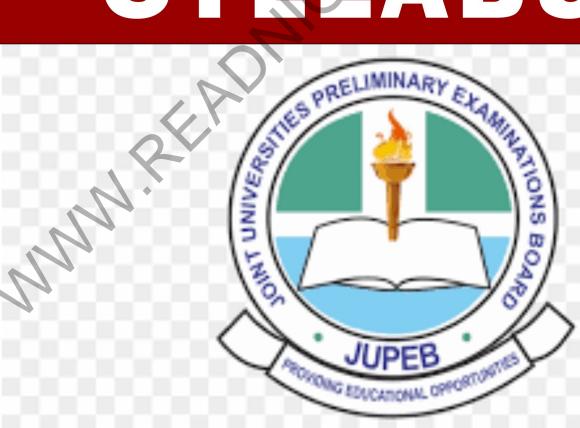
LATEST EDITION

# BIOLOGY

# JUREB SYLEABUS



# especial and an example of the algorithm of the algorithm of the state of the state of the state of the algorithm of the algo

## **SYLLABUS FOR SCI-J152**

antic importance of hyong organisms

rehological and is ochurnical characteristics at

# BIOLOGY and a stability of

exprain the role of cyclosis is the higher cheat classification in his ingurgamization is a via to the circs of evolution; and 2. define hash terminologies of the actus and stare Mendelian Law of inheritance.

FIRST SEMESTER COURSES BIO 001, GENERAL BIOLOGY BIO 003, MICROBIULOGY

SECOND SE MESTER COUNSES BIO 002: BASIC ROTANY

BIO 004: FUNDAMENTALS OF ZOOLOGY

COURSE DESCRIPTION

BIOLOGY 001: General Biology Specific Objectives At the end of the course, the students should be able to:

(stin(f))

**GENERAL OBJECTIVES:** 

At the end of the series of courses, candidates should be able to:

describe the fundamentals and levels of organization in living things;

explain functional units of biological molecules and principles of 2.

interactions among organisms;

apply basic statistical concepts in biological studies; 3.

describe cells as living organisms and their roles in nature; 4.

explain the application of Cell Biology in medical, industrial and 5. biotechnological sub-sectors of economy;

discuss diversity, characteristics, structures, functions and 6. taxonomy of living organisms (micro-organisms, plants and animals);

enumerate economic importance of living organisms; 7.

describe the morphological and biochemical characteristics of 8. micro-organisms;

conduct laboratory and field practical in Biology, Botany, 9.

Microbiology and Zoology;

10. highlight and explain the basic concepts of ecology;

11. explain the role of evolution in the hierarchical classification of living organisms vis a vis the theories of evolution; and

12. define basic terminologies of Genetics and state Mendelian Laws

of inheritance.

FIRST SEMESTER COURSES

(3 UNITS) **BIO 001: GENERAL BIOLOGY** (3 UNITS) **BIO 003: MICROBIOLOGY** 

SECOND SEMESTER COURSES

(3 UNITS) **BIO 002: BASIC BOTANY** (3 UNITS) **BIO 004: FUNDAMENTALS OF ZOOLOGY** 

#### COURSE DESCRIPTION

**BIOLOGY 001: General Biology** 

(3 Units)

**Specific Objectives** 

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

explain living things in nature and biological molecules;

discuss cell as fundamental unit of living things; describe levels of organization of living things;

discuss biological methods and their applications (Biostatistics,

taxonomy and nomenclature);

discuss principles of genetics, variation and heredity; and

conduct laboratory and field practical in biology.

#### Course Content

| S/N     | TOPIC  | SUB TOPIC                                       | DETAILS  |
|---------|--|---|--|
| 1       | Origin of Living   | • The Science of Biology                        | Definition of biology                          |
| ]<br>[] | Things   | <ul> <li>Origin of Organic Molecules</li> </ul> | • Importance of biology                        |
|         |  | <ul> <li>Origin of the First Cells</li> </ul>   | • The nature of science                        |
|         | 明明明 计图形  | • The Earliest Cells:                           | - Scientific methods                           |
|         |  | -Living   | - Testing of hypothesis                        |
|         | and the same of th | -fossils  | - Data collection and analysis                 |
|         |  | start of a little purple program                | • Application of scientific methods in         |
|         |  | annequité et éu monstree.                       | biological experiments                         |
|         |  | Triange of a                                    | Relationship between Biology &                 |
|         | All polarity for   | material . Patronical                           | Medicine, Agriculture, etc.                    |
|         | Property of the second   | The Property of                                 |  |
|         | Table from action of   | Self-1862 County 12 11                          | • Practical class- field observation of        |
| N/I     | Physics and Aphylic  | * to child pure and the control of              | diversity of living things.                    |
|         | Living Things in   | <ul> <li>Diversity of Living Things</li> </ul>  | Different kingdoms and                         |
|         | Nature and   | Biological Molecules                            | characteristics.                               |
|         | Biological   | a to small                                      | Carbohydrate, lipids, protein and              |
|         | Molecules  | and the second                                  | nucleic acids.                                 |
|         | Cell Organisation,   | Cell Theory                                     | Demonstration of cell structure on             |
|         | Structure and  | • Cell Structure and Functions                  |  |
|         | Functions  | • Cell Organization                             | microscopes.                                   |
|         | Tunctions of sen   | Forms in which Cells Exist                      | Biological drawings of plant and animal cells. |
|         |  | Forms in which cens exist                       |  |
| 1       |  |   | Comparisons of plant and animal cells.         |
| 1       | Cell Division,   | Call District                                   |  |
| i þ     | Principles of  | Cell Divisions                                  | Basic concepts in genetics:                    |
|         | Genetics,  | Mitosis in Somatic Cells                        | Chromosome, Gene, allele, dominant             |
|         | Variations and   | Meiosis in Germ Cells                           | recessive, Homozygous,                         |
|         | Heredity   | <ul> <li>Principles of Genetics</li> </ul>      | Heterozygous, Hybrid, genotype,                |
|         | Series States  | Variation and Heredity                          | phenotype etc                                  |
|         | i rako   | <ul> <li>Mendel's Laws of</li> </ul>            | The nature of genes and                        |
|         | A MENSON IN THE REAL PROPERTY.   | Inheritance                                     | chromosomes                                    |
|         |  | er nodenis                                      | • Practical class:                             |
|         | W. Komerce Com   | anni frants                                     | -Determination of inheritance using            |
|         | will harply on past  |   | colored seeds e.g. beads, grains, etc          |
|         | and guilland   | d baloust   toolsal b                           | -Verifications of principles of                |
| 1/ml m  | 0  |   | Mendel's law and its deviation                 |

| lics | odity, and was   | <ul> <li>Human Inheritance</li> <li>Human Genetic Disorders <ul> <li>e.g sickle cell anemia,</li> <li>albinism.</li> </ul> </li> <li>Rhesus Factors</li> <li>Polyploidy</li> <li>Sex-linked Traits</li> <li>Application of Genetics in <ul> <li>Agriculture, Medicine,</li> <li>Criminology, etc.</li> </ul> </li> </ul>  | <ul> <li>Cell division experiment using onion root.</li> <li>Identification of the stages of meiosis</li> <li>Traits controlled by Multiple alleles e.g blood group, eye colour.</li> <li>Determination of inheritance using coloured seeds e.g. beads, grains etc.</li> <li>Verifications of the principles of Mendel's laws.</li> </ul>   |
|------|--|---|---|
| 5    | Systematics:<br>Taxonomy and<br>Nomenclature   | <ul> <li>Basis of Taxonomy</li> <li>Rules of Systematics</li> <li>Naming of Organisms<br/>(Nomenclature)</li> </ul>   | <ul> <li>Practical class:         <ul> <li>Classification and identification of organisms</li> <li>Highlighting adaptive features and their uses</li> </ul> </li> </ul>   |
| 6 6  | Ecology  Marine  | <ul> <li>Basic Concepts in Ecology</li> <li>Biological Associations and<br/>Interactions</li> <li>Ecological Studies</li> <li>Types of Habitats</li> <li>Ecology and Natural<br/>Selection.</li> </ul>  | <ul> <li>Symbiosis</li> <li>Mutualism</li> <li>Parasitism</li> <li>Environmental studies</li> <li>Practical use of ecological equipment</li> <li>Population study in a specific habitat</li> <li>Environmental changes</li> <li>Biological impacts of climate change</li> </ul>   |
| 7    | Biological Methods and Application  Indicate an article of the control of the con | Drawings  Admitional and an analysis of the second and an analysis of the second and an analysis of the second and analysis of the second analysis of the second analysis of the second and analysis of the second analysis of | Standard drawing rules governing: use of pencils, specimen proportions, magnification, size of specimen drawing and labelling.  Diagrams must be according to length specification  Lines must not be wooly or broken  Drawings must carry appropriate titles at the correct position  Labeling must be horizontal & parallel with ruled guidelines  Drawing must not be artistic i.e. no shading or painting.  Spellings must be correct and touched by labelling lines. |

UPLOADED BY WWW.READNIGERIANETWORK.COM

| <ul> <li>Geological Times, and Mega Geological Events</li> <li>Evolutionary Trends in Animals and Plants</li> <li>Theories of Evolution-Lamarck and Darwin Theories of Evolution</li> <li>Evidence of evolution from Anatomy, Embryology, Biochemistry.</li> </ul> | <ul> <li>Definition of evolution</li> <li>Types of evolution</li> <li>Application of Evolution to Plants &amp; Animals Taxonomy.</li> </ul> |
|--|---|
|--|---|

#### RECOMMENDED TEXTS

- 1. Functional approach by MBV Roberts, 1982. Third edition.
- 2. Advanced Biology by Simkins & Williams, 1989. Third edition.
- 3. Collins College Biology (Fully revised and updated) by Marshall Sunder, Ph.D., 2007.
- 4. Heath Biology by James Mclaren & Lissa Rotundo, 1985. D.C Heath and Company.
- 5. "Biology" by P.T Raven and B. Johnson, 4th Edition.1996, WCB McGraw-Hill Companies, Inc. USA.

#### **Specific Objectives**

At the end of this course, candidates should be able to:

- 1. discuss the general characteristics of plants;
- 2. explain the taxonomy of lower and higher plants;
- 3. discuss biodiversity and conservation of plants;
- 4. explain plant structures and functions;
- 5. explain physiological processes in plants; and
- 6. enumerate economic and ecological importance of plants.

#### **Course Content**

| S/N   | TOPIC                       | SUB TOPIC   | DETAILS  |
|-------|-----------------------------|---|--|
| 1     | General Characteristics and | Plant Diversity and   | Classification of major plant groups(Lower and Higher plants)  |
| lsriz | Diversity of Plants         | Classifications (Lower and Higher plants)  Characteristics of Lower and     | <ul> <li>Divisions up to generic level</li> <li>Lower plants- algae, fungi,<br/>Bryophytes, Pteridophytes</li> </ul> |
| D.C   | orundo, 1985.               | <ul><li>Higher Plants groups</li><li>Morphology and Life Cycle of</li></ul> | Morphological and life cycle of<br>named example in each major   |
| YCB   | 3dition. 1996. V            | Lower and Higher Plants   | group considering the simplest<br>and the complex in each group of   |
|       |                             | 1823, MRC, USAA.  | <ul> <li>the lower plants</li> <li>Economic and ecological importance of plant groups</li> </ul>                     |
|       |                             |   | Practical class- classification and morphological drawings of lower plants:  |
|       |                             |   | plants: Algae (Chlorella, Euglena/Chlamydomonas, Volv  |
| 1     |                             |   | <ul> <li>Spirogyra)</li> <li>Fungi e.g. yeast, Rhizopus,</li> <li>Mucor, Aspergylus, Penicillium</li> </ul>          |
|       |                             |   | <ul> <li>mushroom, Phytophthora,</li> <li>Bryophytes eg Riccia,</li> <li>Marchantia, Funaria</li> </ul>              |
|       |                             |   | • Pteridophytes eg Lycopoulum  |
|       |                             |   | Higher plant ( Non-vases   |
|       |                             |   | vascular plants) • Spermatophytes eg Cycas, pinus Gnetum, Hibiscus rosa-sinensis                                     |

| 3   | Taxonomy of Lower and Higher Plants  Plant Conservation  | <ul> <li>Plant Taxonomy and         Systematics</li> <li>Taxonomy of Lower and         Higher Plants</li> <li>Importance of Plant         Conservation</li> <li>Measures in Plant         Conservation</li> </ul> | <ul> <li>Eleusine indica and Talinum</li> <li>Plant nomenclature</li> <li>Plant classification</li> <li>The difference between taxonomy and systematics.</li> <li>In-situ and ex-situ conservation</li> <li>Advantages and disadvantages of each</li> <li>Biological control</li> </ul>  |
|-----|--|---|--|
| 4   | Plant Tissues and  | <ul> <li>Climate change</li> <li>Plant Tissues Anatomy</li> </ul>   | <ul> <li>Pest management</li> <li>Impact of climate change on plants</li> </ul>  |
|     | Functions  Latel her who what he continued to the continu | • Functions   | Emphasis on composition, distribution, forms and functions of each tissues:  Parenchyma Collenchyma Schlerenchyma Epidermal Peridermal Vascular (cambium, phloem,  |
| 4.0 | en one consequity is not seen to see the seen  | and and analysis  | xylem)  • Practical class in osmosis and transpiration in plants.  |
| 5   | Plant Morphology/ Anatomy  (Garage  (Garage  (Garage)  ( | <ul> <li>Morphology of Plant Parts</li> <li>Anatomy of Plant Parts</li> <li>Types of Root</li> </ul>  | <ul> <li>Morphology of roots, stems, leaf types and their modification due to functions</li> <li>Anatomy of monocot and dicot roots, stems and leaves with emphasis on tissue arrangement in relation to functions and environment</li> <li>Practical class-</li> <li>Roots-</li> <li>Adventitious and tap root systems, modification and adaptations</li> <li>Anatomical observation and</li> </ul> |
| H.  |  |   | drawing of permanent/ temporary mount of monocot and dicot roots (T.S and L.S) - Locate, draw and label different plant tissues  |

| UPLDA  | DED BY WWW.READNIGERIANETWOR   | RK.COM | (parenchyma, collenchyma etc)                         |
|--|--|--------|---|
| and the state of t | Types of Stem  |        | Stem  |
|  | Types of Stem  |        | Aerial and und  |
|  |  |        | modifications/ adaptations                            |
|  |  | ter"   | related to funct:                                     |
|  |  | 1.     | Anatomical observation and                            |
| 2 1 1  |  | 7, -   | drawing of permanent/                                 |
| Although Herry Trusted A   |  | E I    | temporary manufacture                                 |
| 2 15 27 15 27  |  |        | and dicot stems (T.S.                                 |
| The same of the sa |  |        | and dicot stems (T.S and L.S)  Locate, draw and label |
| U <sub>1</sub> , v <sub>2</sub> , · · · · · · · · · · · · · · · · · · ·  |  |        | different plant tissues                               |
| Marchaelle De leure al la  |  |        | (parenchyma, collenchyma                              |
| 1.2  | The state of the s | 1 4 1  | etc)  |
| W I TO TO DALM I   | Types of Leaves  | • L    | Leaves-   |
| a de la sectión de la properties de la p |  | -      | Simple and compound leaves,                           |
| and the first of the second  |  |        | arrangements, modifications                           |
|  |  | 14.17  | to suit habitats                                      |
| The San Control of the San Est. 182  |  |        | T.S of leaves of both monocot                         |
| KALSP SHIPS IN A SALE ASSESSMENT OF PARTY OF   | 21.010   | 10)    | and dicot plants                                      |
| . A  |  | -      | Locate, draw and label                                |
| # # C \ C \ C \ C \ C \ C \ C \ C \ C \  |  |        | different plant tissues                               |
| 45.5% (f) (f · 5)  |  | ,      | (parenchyma, collenchyma                              |
| 22 1 (15 - 17 x t)   |  |        | etc)  |
| •  | Types of Flowers   | • F    | lowers –  |
| 393325 G C)  |  | -      | L.S of dicot flowers e.g                              |
| in visit (admin min, phiespi   |  |        | regular and irregular flowers,                        |
| (1) Jin  |  |        | floral diagrams and formula                           |
| tion matter to plants.   | Types of Fruits  | • Fi   | ruits –   |
| me in and in plants.   |  | -      | L.S and T.S of various types                          |
| had sonote aloan in racion of  | shology of Plant Pary  |        | of fruits (dry dehiscent,                             |
| suit outen modificates into  | converted Part Parts b   |        | indehiscent and fleshy fruits                         |
| sur rounderwate to be a leg  | em i mbra io yida  |        | should be observed and                                |
| 6 Nutrition in Plants •  | Notice and Towns CNL 4.11  |        | drawn).   |
| 6 Nutrition in Plants •  | Nature and Types of Nutrition  |        | utotrophic (photosynthetic and                        |
| ni ins aregan by a no arangen  |  |        | nemosynthetic)  |
| alon in to the state of the  |  |        | ark and light reaction in                             |
| In Sound Joyce   |  | -      | notosynthesis   |
| walt is navi   |  |        | eterotrophic  |
| - 100 %  |  | • n    | olozoic nutrition  fineral requirements of plants,    |
| tion gar but auditionaries   | 1.42.0 [13, 5]   | • [V]  | eir sources, roles and deficiency                     |
| t as ar modificar as at  |  |        |   |
| acontracta   | 1  | sy     | mptoms omposition of chemical                         |
| A laterthesis encommission and   |  |        | rtilizers   |
| Wishermay to prove b   |  |        | notical class-  |
| R report y mount of moreont  |  | • rī   | Demonstration of etiolation.                          |
| Ad, Mais a. () app. soci. Lie  |  | ·      | Measurement of  |
| In Haid town   |  | •      | 1 -i- in leaf   |
| The state of the s |  |        | photogyntnesis ili ica.                               |
| Is fall both and stead 1 and an arms of the  |  |        | photosynthesis in leaf Growth experiments to show     |

|        |  |   | deficiency symptom  NETWORK ied study of deficiency symptoms in plants  |
|--------|--|---|---|
| 7      | Transport System in plants                   | <ul> <li>Need for Transport System</li> <li>Water Relation</li> </ul> | <ul> <li>Mineral requirements of plants</li> <li>Transport in xylem</li> <li>Transport in phloem</li> <li>Transport media in plant and materials to be transported</li> </ul> |
|        | person to vital                              | Mary offi<br>Mart   | Practical class     -Transpiration, osmosis, and food transport in plants   |
| 8      | Respiration                                  | <ul> <li>Mechanism of Gaseous<br/>Exchange</li> </ul>                 | <ul> <li>Stomata apparatus</li> <li>Lenticels</li> <li>Aerobic and anaerobic respiration</li> </ul>   |
| 9      | Plant reproduction                           | Asexual and Sexual Reproduction                                       | Angiosperm flower and<br>differences between monocots and<br>dicot flowers  |
| 10     | Growth Regulators                            | Roles and Interactions of<br>Growth Regulators                        | <ul> <li>Auxins</li> <li>Gibberellins</li> <li>Cytokinins</li> <li>Ascorbic acids</li> <li>Ethylene</li> </ul>  |
| 11 les | Crop improvement                             | • Importance of GMC   | <ul> <li>Genetically Modified Crops         (GMC)</li> <li>Challenges of resistant plant species</li> <li>Ethical implications of genetic modifications</li> </ul>            |
| 12     | Economic and Ecological Importance of Plants | Plants of Economic & Medical Importance                               | <ul> <li>Economically important food plants</li> <li>Economically valuable medicinal plants</li> <li>Ornamental plants</li> </ul>   |

BIO 003 (Microbiology)

(3 Units)

Specific Objectives

At the end of this course, candidates should be able to:

1. discuss history and discovery of microorganisms;

2. discuss the different types of microorganisms and the taxonomic groupings:

3. explain microbial cellular structures, morphology and biochemical characteristics;

4. explain microbial genetics and applications in biotechnology;

5. enumerate economic importance of microorganisms.

| S/N         | Irse Content UPLO  | SUB TOPIC  | _       | The theory of spontaneous                         |
|-------------|--|--|---------|---|
| 1           | History of the   | Spontaneous Generations  | •       | The theory of spontaneous generation of organisms |
| 1           | Discovery of   | <ul> <li>Microorganisms as the Cause</li> </ul>  |         | Of Organisms                                      |
|             | Microorganisms   | of some Diseases   | •       | Conflict over spontaneous                         |
|             | Microorganis   |  |         | generations                                       |
|             | tarene a   | 4  | •       | The golden era of microbiology                    |
|             | A 12.4 Land  | · 171 4  |         | (1860-1910)                                       |
|             | Horar, d. ber a 1996.  | 1  |         | The germ theory of disease                        |
|             | ARREST OF THE  | o chi  | •       | The discovery of viruses                          |
|             | and a second creek and the first   | S Transfer   | •       | microorganisms in the 20th century                |
|             | aga saudr  | And the second of the second o | •       | Practical class- introduction to bas              |
|             | 5  |  | -       | microbial laboratory equipment,                   |
|             | Füdes sint american.   |  |         | principles of operation and drawing               |
| 2           | Types and  | • Seven Levels of  | •       | Bacteria- size, shapes, motility.                 |
| bri         | Taxonomic  | Classification   | 13      | unusual types, general methods of                 |
|             | Groupings of   | Prokaryotic Cells  |         | bacterial classification                          |
|             | Microorganisms   | Eukaryotic Cells   | •       | Fungi- yeast and mould- size, shap                |
|             | 141101001Bamsims   | 200 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2  |         | general fungal classification                     |
|             | efti.  | 1.102 1 0  |         | Protozoa- specific examples, motil                |
|             | ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )  | teff a   |         | and non-motile types, nutrition typ               |
|             | and the first of the sale  |  | •       | Viruses- sizes, bacteriophages,                   |
|             | Rink balabalay to  | 3163   | 194 [19 | viroid, prions                                    |
| PRIV        | manaires in train  | Ja 3 - 6   |         | Algae- sizes, types, diatoms, sea                 |
|             |  | 11/10  | •       | weeds, lichens, sexual and asexual                |
| aitm        | og to ancitablique   | musike a second  |         | reproduction                                      |
|             | a Haliai   | iniz d   |         | Archaea- general features, origin a               |
|             | Anna de la company de la compa | Francisco Company  |         | evolution   |
|             | book natingari vilkolo   | interface & materialist  | •       | Practical class- aseptic techniques               |
| 100         | nlighte deikana man  | 100 A  | সাৰ     | microbiology                                      |
| 3.4011      | milano emisoro o may   | Partie   |         | microbiology                                      |
| i<br>Lingui | Structures,  | Morphology and Structures  | _       | Structure of bacteria cells- capsule              |
| - 1-1       | Morphology and   | of Microbial Cells   | •,<br>! | •   |
|             | Characteristics of   | D: 1 : 101   |         | flagella, pilli and fimbriae, cell wa             |
|             |  |  |         | plasma membrane, cytoplasm                        |
|             | Microorganisms   | Reproduction, Growth Types     and Phases  | · V     | Cell wall of fungal cells, cytoplasm              |
|             | , , , , , , , , , , , , , , , , , , ,  | wild I Hubbb   | • 1     | Cultural characteristics of bacterial             |
|             | 13   | itto yr motor ir ymu.  | 1.54    | growth-on solid and liquid media,                 |
| 1.0         | nother taxonon   | u and eliterappe cataloni i a tra  | ij.     | forms of growth                                   |
|             |  |  | •       | Cultural and cellular characteristics             |
|             | Free titel   | nig in a management of the second  | 1       | of mould and yeast on solid and                   |
|             | 13117 113  | enigion, scorence a  | 12      | liquid media, hyphal and mycelial                 |
|             |  |  | Prof &  | types   |
|             | . Vigolombaso d  | ar anchirollage banks  | •(1     | Biochemical characterization of                   |
|             |  |  |         | bacteria and fungi                                |
|             | . Holenbrack Carl  |  | •       | Viruses and their structures                      |
| - 1         | 1.0  | \$270000 mile cassaur  | 1.3     | Reproduction and microbial growth                 |

| TO SHE THE TO STATE OF THE SHEET OF THE SHEE | UPLOADED BY WWW.READNIGER  | phases Practical class- cultivation and identification of bacteria from soil, water and decomposing food  |
|--|--|---|
| 4 Microbial Ecology  | Microbial Interactions with<br>Animals, Plants and<br>Microbes   | <ul> <li>Predation</li> <li>Competition</li> <li>Synergism</li> <li>Commensalism</li> <li>Infectious diseases</li> <li>Immunity</li> <li>Spoilage of food</li> </ul>  |
| Microbial Nucleic Acids in Information Storage and Transfer Microorganisms and their Application in Biotechnology  | <ul> <li>Genetic Materials</li> <li>Mutation and Mutagenesis</li> <li>Biotechnological<br/>Application of<br/>Microorganism in Various<br/>Fields</li> </ul> | <ul> <li>Control of microbial activities</li> <li>Nature of DNA</li> <li>Nucleosides and nucleotides</li> <li>Types of RNA</li> <li>Enzymes in DNA replication</li> <li>Genetic code</li> <li>Transcription and translation</li> <li>Transfer of genetic materials in prokaryotes</li> <li>Spontaneous mutation, induced mutation, expression of mutation</li> <li>Biotechnological use of microorganisms in</li> <li>Food industry, - Environment,</li> <li>Pharmaceuticals, Medical, and</li> <li>Agricultural fields.</li> </ul> |

### **BIO 004 (Introductory Zoology)**

(3 Units)

## Specific Objectives

At the end of this course, candidates should be able to:

- discuss the general characteristics of kingdom Animalia;
- 2. explain the taxonomy of invertebrates and vertebrates;
- 3 discuss diversity of animal species;

· Portsytte Hat verney head

- 4. explain physiological processes in animals; and
- 5. enumerate the economic and ecological importance of animals. since talt privil and ...

| -   | Diversity and                           | <ul> <li>What Is Zoology? What are</li> </ul>  | •        | General characteristics of                                   |
|-----|---|--|----------|--|
| 1   | General LIPI                            |  |          | animaic  |
|     | Characteristics of                      | Animals?  OADED BY WWW.READNIGERIANETWORK  Scope and Areas in Zoology  | MOD.     | Diversity of lifestyles, habitats  Categories of animals     |
|     | Animals                                 | <ul> <li>Importance of Zoology</li> </ul>  | •        | Categories of animals  |
| -   | i deposita con                          | (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)  |          |  |
|     |   | Þ  |          |  |
|     |   | - 10 April 1 |          |  |
|     |   | July No. 1 Tar Villa (20   | dest     | and the second   |
| 2   | Systematics                             | Classification of Animals  |          | Unicellular levels of  |
| -   | (Taxonomy) of                           | Basis of Animal Classification   | 1        | organization- protozoa                                       |
|     | Animals                                 | • Levels of Animal Organization  | •        | Cellular levels of organization-                             |
|     | 71.00                                   | Phyla of Animals   |          | eumetazoa  |
|     | 25-16-0                                 | <ul> <li>Tissues and Organs in Animals</li> </ul>  |          | Multicellular levels of                                      |
|     |   | 1  |          | organization- metazoan                                       |
|     | (2)                                     | August 10 W  | •        | Classification of invertebrates                              |
|     | 71 1 1 1 1 1 1 1 1                      |  | 4        | - Animals without tissues                                    |
| 1   | 1                                       | deirotek o   | I amai   | - Animals with tissues                                       |
|     | 0. V.1. 1                               | in a second Marie 20   | i atroli | - Animals exhibiting bilateral                               |
|     | and spining and a                       | de la la se la segui demanda mar en  | 1        | symmetry (bilateria)   |
|     | · (x <sup>(1)</sup> )                   | 14 . B   |          | - Animals with body cavity                                   |
|     | units about Aria                        | 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1   |          | (coelomates).  |
|     |   | 1000 100 100   |          | Segmented animals  |
|     | gestylen at ince the                    | (B) (C)  | aloib    | Animals with jointed   |
|     |   | In resince   | Jaga     | appendages Animals with backbone                             |
|     | म अंग्रामा । योगाना प्र                 | And the second second  | or its   |  |
|     |   | Organish di Albania at Managao   | Llow     | (vertebrates) Major and minor phyla                          |
|     | beginn ,andalum ./                      | STEEL TO BE  | 1        | Types of tissues and organ                                   |
|     | a sinter form or appa                   | TO THE STATE OF TH | l        | systems  |
| 1   | 10 John Charlette                       |  |          | Practical class-   |
| d - | w.code                                  | 1216 c. 10   | • •      | Identification and   |
|     | my man and a serial factorial           |  | 1 1      | classification of animal                                     |
|     | 1                                       |  | 74       | specimens in the different                                   |
| 6   | 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 |  |          | phyla  |
| L   |   | The second secon | -        | Dissection of selected                                       |
|     |   | /  |          | animals- cockroaches, fish,                                  |
|     |   | (439100  | 1 1      | frog. rat. etc.  |
| 3   | Evolution of                            | History and Origin of Animals  | • A      | Adaptation of animals in water                               |
| 3   | Animals                                 | Major Evolutionary Adaptation  | • A      | daptation of animals on land                                 |
|     | Allillais                               | of Animals   | A A      | Adaptation of animals in air                                 |
|     | 197                                     | ALLE TO BEING A WORLD THEFT  | Mark Co  | DELL'A VERB EC ES. U.S. P.                                   |
|     | , allent                                | actoristics of kingden 3   | GIL      | discuss the general  |
|     |   | The state of the s |          | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1                        |
| 4   | Invertebrates                           | Phylum Protozoa  | • T      | axonomy, characteristics,                                    |
|     |   | Phylum Porifera     Square In Communication  | HIAd     | iversity, lifestyles, morphology                             |
|     |   | Phylum Cnidaria (Coelenterata)   | a        | nd life cycle providing named epresentative examples in each |
|     | alarming by sor                         | Phylum Platyhelminthes   | re       | epresentative examples in                                    |
|     | regardent free all weeks                | Phylum Nematoda  |          | rder   |
| 2   |   | Phylum Annelida  | • F      | ree living flat worms arasitic flat worms (trematodes        |
|     | N                                       | Phylum Arthropoda  | • P      | arasilic hat worms (2007)                                    |

|     |  | Phylum Mollusca   |   |
|-----|--|---|---|
| 5-1 | or the second se | • Phylum Echinodermatenigerians   | and cestodes) of medical and  TWO Vetermary importance  Emphasize the body plan  Why arthropods are successful.   |
| 5   | Introduction to Chordates  | <ul> <li>Adaptation of Chordates to Water, Land and Air.</li> <li>Protochordates</li> <li>Class Pisces</li> <li>Class Amphibia</li> <li>Class Reptilia</li> <li>Class Aves</li> <li>Class Mammalia</li> </ul> | <ul> <li>Challenges and adaptations to living in the different habitats</li> <li>History and important adaptations</li> <li>Diversity, classification, morphology and life cycle, providing representative examples from the different orders</li> <li>History and important adaptations</li> <li>Rise and fall of dominant reptiles</li> <li>Clearly state the taxonomic features that warrant the grouping into classes.</li> </ul> |
| 7   | Ecologic and Economic Importance of Animals  | Diverse Economic Importance of Animals  - Invertebrates - Vertebrates Ecological Importance of Animals  | Benefits of animals to man     Economic importance of arthropods  |
| 8   | Physiological<br>Processes   | Nutrition in Animals  Respiration in Mammals  | <ul> <li>Types of nutrition in animals</li> <li>Nutrition in human</li> <li>Types of dentition in animals</li> <li>Alimentary system in man</li> <li>Digestion (diverse enzymes) and absorption</li> <li>Practical class- food test</li> <li>Lung as a respiratory organ</li> <li>Role of circulatory system in respiration</li> </ul>  |
|     |  | Skeletal System   | <ul> <li>Morphology and function of human skeleton</li> <li>Forms of skeleton</li> <li>Components of and differences between bone and cartilage</li> <li>Parts of mammalian endoskeleton</li> <li>Definition and types of joint</li> </ul>  |

| Company of the Compan | <b>Дергофистог</b> w.readnigerianetwor   | Vertebrate reproduction Structure and function of human female and male reproductive system.  |
|--|--|---|
| Transport of Substances across Membranes   | Excretion  And   | <ul> <li>Morphology of the excretory system</li> <li>Osmoregulation</li> <li>Structure and function of the nephron – ultrafiltration, selective reabsorbtion and excretion.</li> <li>The effects of weather on excretion.</li> <li>human circulatory/transport system</li> <li>blood as agent of transport</li> </ul> |
| then yours, a thin is a color of the color o | over the languages of a Baner  | Components of blood The functions of blood Types of circulation Principles of development- stage in embryology.  Osmotic balance  |
| of in huma;  of dentification in annuals;  of dentification in the many  construction of the construction  | <ul> <li>Diffusion</li> <li>Osmosis</li> <li>Plasmolysis</li> <li>Flaccidity</li> <li>Haemolysis</li> <li>Crenation</li> <li>Turgidity</li> </ul>  | <ul> <li>Selective transport of substances across membranes</li> <li>Osmotic pressure</li> <li>Turgor pressure</li> <li>Active transport</li> <li>Practical class- experiment demonstrating diffusion, osmos and plasmolysis</li> </ul>   |
| the metal services of the serv | mipor and a second and a second a secon | : Jerstvik  |

Farty or manuscrian cardiago or cardiago o

union to capy from a subfile.

# RECOMMENDED FRAME SY WWW.READNIGERIANETWORK.COM

- Vines A. E. and Rees N. Plant and Animal biology (6th edition)

  Bath Great Britain, Pitman Press.
- 2. Muller, W. H. Botany A Functional Approach (4th Edition). New York, Macmillan.
- Dutta, A.C. Botany for degree students (6th Edition) Oxford United Kingdom, University Presss.
- 4. Michael, T. Madigan et al., *Brock Biology of Microorganism* 13th Edition. New York, Pearson Education.
- 5. Laboratory Manuals as applicable in different Departments of study
- 6. Dytham, C. Choosing and using statistic, a biologist guide. (3rd Edition) United Kingdom, Wiley Blackwell.
- 7. Tamarin, R. H. *Principles of Genetics* McGraw-Hill, United States of America.
- 8. Klug, W. S. et al., *Essentials of genetics* Pearson Benjamin Cummings (7th Edition), United States of America.