Core Curriculum and Minimum Academic Standards (CCMAS) for the Nigerian University System

DEPARTMENT OF ZOOLOGY
THIRTY PERCENT INCLUSION TO THE SEVENTY PERCENT CCMAS

100 Level

NUC

Course code	Course title	Unit (s)	Status	LH	PH	Semester
GST 111	Communication in English	2	C	15	45	1st
GST 112	Nigerian Peoples and Culture	2	C	30	-	2nd
MTH 101	Elementary Mathematics I	2	C	30	-	1st
MTH 102	Elementary Mathematics II	2	C	30	-	2nd
COS 101	Introduction to Computing Sciences	3	C	30	45	1st
BIO 101	General Biology I	2	C	30	-	1st
BIO 107	General Biology Practical I	1	C	-	45	1st
CHM 101	General Chemistry I	2	C	30	-	1st
CHM 107	General Chemistry Practical I	1	C	-	45	
PHY 101	General Physics I	2	C	30	45	1st
PHY 107	General Physics Practical I	1	C	-	45	
BIO 102	General Biology II	2	C	30	-	2nd
BIO 108	General Biology Practical II	1	C	-	45	2nd
CHM 102	General Chemistry II	2	C	30	-	
CHM 108	General Chemistry Practical II	1	C	-	45	
PHY 102	General Physics II	2	C	30	-	
PHY 108	General Physics Practical II	1	C	-	45	
ZOO 101	The Mammalian Body	2	C	15	45	2nd
ZOO 102	Animal Diversity	2	C	15	45	2nd
UI-ZOO 103	Introductory Ecology	2	R	30	-	1st
STA 111	Descriptive Statistics	3	E	45	-	1st
	Total	**38**				

Course Contents and Learning Outcomes

GST 111: Communication in English   (2 Units C: LH 15; PH 45)

Learning Outcomes

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

1. identify possible sound patterns in English Language;

2. list notable language skills;

3. classify word formation processes;

4. construct simple and fairly complex sentences in English;

5. apply logical and critical reasoning skills for meaningful presentations;

6. demonstrate an appreciable level of the art of public speaking and listening; and

7. write simple and technical reports.

Course Contents

Sound patterns in English Language (vowels and consonants, phonetics, and phonology). English word classes (lexical and grammatical words, definitions, forms, functions, usages, collocations). Sentence in English (types: structural and functional, simple, and complex). Grammar and Usage (tense, mood, modality and concord, aspects of language use in everyday life). Logical and critical thinking and reasoning methods (logic and syllogism, inductive and deductive argument and reasoning methods, analogy, generalisation and explanations). Ethical considerations, copyright rules, and infringements. Writing activities: (pre-writing, writing, post writing, editing and proofreading; brainstorming, outlining, paragraphing). Types of writing: summary, essays, letter, curriculum vitae, report writing, note making etc. Mechanics of writing. Comprehension Strategies: (reading and types of reading, comprehension skills, 3RsQ). Information and Communication Technology in modern Language Learning. Language skills for effective communication. Major word formation processes. Writing and reading comprehension strategies. Logical and critical reasoning for meaningful presentations. Art of public speaking and listening. Report writing.

GST 112: Nigerian Peoples and Culture   (2 Units C: LH 30)

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

1. analyse the historical foundation of the Nigerian culture and arts in pre-colonial times;

2. list and identify the major linguistic groups in Nigeria;

3. explain the gradual evolution of Nigeria as a political unit;

4. analyse the concepts of trade, economic and self-reliance status of the Nigerian peoples towards national development;

5. enumerate the challenges of the Nigerian state towards nation building;

6. analyse the role of the judiciary in upholding people's fundamental rights;

7. identify acceptable norms and values of the major ethnic groups in Nigeria; and

8. list and suggest possible solutions to identifiable Nigerian environmental, moral and value problems.

Course Contents
Nigerian history, culture, and art up to 1800 (Yoruba, Hausa and Igbo peoples and culture; peoples and culture of the ethnic minority groups). Nigeria under colonial rule (advent of colonial rule in Nigeria; colonial administration of Nigeria). Evolution of Nigeria as a political unit (amalgamation of Nigeria in 1914; formation of political parties in Nigeria; nationalist movements and struggle for independence). Nigeria and challenges of nation building (military intervention in Nigerian politics; Nigerian civil

war). Concept of trade and economics of self-reliance (indigenous trade and market system; indigenous apprenticeship system among Nigerian people; trade, skill acquisition and self-reliance). Social justices and national development (law definition and classification. Judiciary and fundamental rights. Individual, norms and values (basic Nigerian norms and values, patterns of citizenship acquisition; citizenship and civic responsibilities; indigenous languages, usage, and development; negative attitudes and conducts. Cultism, kidnapping and other related social vices). Re-orientation, moral and national values (The 3R's – Reconstruction, Rehabilitation and Re-orientation; Re-orientation Strategies: Operation Feed the Nation (OFN), Green Revolution, austerity measures, War Against Indiscipline (WAI), War Against Indiscipline and Corruption (WAIC), Mass Mobilization for Self-Reliance, Social Justice and Economic Recovery (MAMSER), National Orientation Agency (NOA). Current socio-political and cultural developments in Nigeria.

MTH 101: Elementary Mathematics I (Algebra and Trigonometry) (2 Units C: LH 30)

Learning Outcomes

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

1. explain basic definition of set, subset, union, intersection, complements and use of Venn diagrams;

2. solve quadratic equations;

3. solve trigonometric functions;

4. identify various types of numbers; and

5. solve some problems using binomial theorem.

Course Contents

Elementary set theory, subsets, union, intersection, complements, Venn diagrams. Real numbers; integers, rational and irrational numbers, mathematical induction, real sequences and series, theory of quadratic equations, binomial theorem. Complex numbers; algebra of complex numbers; the Argand diagram. De-Moivre's theorem, nth roots of unity. Circular measure, trigonometric functions of angles of any magnitude, addition, and factor formulae.

MTH 102: Elementary Mathematics II (Calculus) (2 Units C: LH 30)

Learning Outcomes

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

1. identify the types of rules in differentiation and integration;
2. describe the meaning of function of a real variable, graphs, limits, and continuity; and
3. solve some applications of definite integrals in areas and volumes.

Course Contents

Functions of a real variable, graphs, limits, and idea of continuity. The derivative, as limit of rate of change. Techniques of differentiation. Extreme curve sketching; integration as an inverse of differentiation. Methods of integration, Definite integrals. Application to areas, volumes.

COS 101: Introduction to Computing Sciences (3 Units C: LH 30; PH 45)

Learning Outcomes

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

1. explain basic components of computers and other computing devices;
2. describe the various applications of computers;
3. explain information processing and its roles in the society;
4. describe the Internet, its various applications and its impact;
5. explain the different areas of the computing discipline and its specializations; and
6. demonstrate practical skills on using computers and the internet.

Course Contents

Brief history of computing. Description of the basic components of a computer/computing device. Input/Output devices and peripherals. Hardware, software and human ware. Diverse and growing computer/digital applications. Information processing and its roles in society. The Internet, its applications and its impact on the world today. The different areas/programs of the computing discipline. The job specializations for computing professionals. The future of computing.

Lab Work: Practical demonstration of the basic parts of a computer. Illustration of different operating systems of different computing devices including desktops, laptops, tablets, smart boards and smart phones. Demonstration of commonly used applications such as word processors, spreadsheets, presentation software and graphics. Illustration of input and output devices including printers, scanners, projectors and smartboards. Practical demonstration of the Internet and its various applications. Illustration of browsers and search engines. How to access online resources.

CHM 101: General Chemistry I   (2 Units C: LH 30)

Learning Outcomes

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

1. define atom, molecules, and chemical reactions;

2. discuss the Modern electronic theory of atoms;

3. write electronic configurations of elements on the periodic table;

4. justify the trends of atomic radii, ionization energies, electronegativity of the elements based on their position in the periodic table;

5. identify and balance oxidation – reduction equation and solve redox titration problems;

6. illustrate shapes of simple molecules and hybridized orbitals;

7. identify the characteristics of acids, bases, and salts, and solve problems based on their quantitative relationship;

8. apply the principles of equilibrium to aqueous systems using Le Chatelier's principle to predict the effect of concentration, pressure, and temperature changes on equilibrium mixtures;

9. analyse and perform calculations with the thermodynamic functions, enthalpy, entropy, and free energy; and

10. determine rates of reactions and its dependence on concentration, time, and temperature.

Course Contents

Atoms, molecules, elements and compounds and chemical reactions. Modern electronic theory of atoms. Electronic configuration, periodicity and building up of the periodic table. Hybridization and shapes of simple molecules. Valence forces; structure of solids. Chemical equations and stoichiometry; Chemical bonding and intermolecular forces, kinetic theory of matter. Elementary thermochemistry; rates of reaction, equilibrium, and thermodynamics. Acids, bases, and salts. Properties of gases. Redox reactions and introduction to electrochemistry. Radioactivity.

CHM 102: General Chemistry II   (2 Units C: LH 30)

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

1. state the importance and development of organic chemistry;
2. define fullerenes and their applications;
3. discuss electronic theory;
4. determine the qualitative and quantitative of structures in organic chemistry;
5. describe rules guiding nomenclature and functional group classes of organic chemistry;
6. determine rate of reaction to predict mechanisms of reaction;
7. identify classes of organic functional group with brief description of their chemistry;
8. discuss comparative chemistry of group 1A, IIA and IVA elements; and
9. describe basic properties of transition metals.

Course Contents
Historical survey of the development and importance of organic chemistry; Fullerenes as fourth allotrope of carbon, uses as nanotubules, nanostructures, nano chemistry. Electronic theory in organic chemistry. Isolation and purification of organic compounds. Determination of structures of organic compounds including qualitative and quantitative analysis in organic chemistry. Nomenclature and functional group classes of organic compounds. Introductory reaction mechanism and kinetics. Stereochemistry. The chemistry of alkanes, alkenes, alkynes, alcohols, ethers, amines, alkyl halides, nitriles, aldehydes, ketones, carboxylic acids, and derivatives. The

chemistry of selected metals and non-metals. Comparative chemistry of group IA, IIA and IVA elements. Introduction to transition metal chemistry.

CHM 107: General Chemistry Practical I (1 Unit C: PH 45)

Learning Outcomes

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

1. describe the general laboratory rules and safety procedures;

2. collect scientific data and correctly carry out chemical experiments;

3. identify the basic glassware and equipment in the laboratory;

4. identify the differences between primary and secondary standards.

5. perform redox titration;

6. record observations and measurements in the laboratory notebooks; and

7. analyse the data to arrive at scientific conclusions.

Course Contents

Laboratory experiments designed to reflect topics presented in courses CHM 101 and CHM 102. These include acid-base titrations, qualitative analysis, redox reactions, gravimetric analysis, data analysis and presentation.

CHM 108: General Chemistry Practical II (1 Unit C: PH 45)

Learning Outcomes

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

1. identify the general laboratory rules and safety procedures;

2. collect scientific data and correctly carry out chemical experiments;

3. identify the basic glassware and equipment in the laboratory;

4. identify and carry out preliminary tests which include ignition, boiling point, melting point,

test on known and unknown organic compounds;

5. execute solubility tests on known and unknown organic compounds;

6. execute elemental tests on known and unknown compounds; and

7. conduct functional group/confirmatory test on known and unknown compounds which could be acidic / basic / neutral organic compounds.

Course Contents

Continuation of CHM 107. Additional laboratory experiments to include functional group analysis, quantitative analysis using volumetric methods.

PHY 101: General Physics I (Mechanics) (2 Units C: LH 30)

Learning Outcomes

On completion, the students should be able to:

1. identify and deduce the physical quantities and their units;

2. differentiate between vectors and scalars;

3. describe and evaluate motion of systems on the basis of the fundamental laws of mechanics;

4. apply Newton's laws to describe and solve simple problems of motion;

5. evaluate work, energy, velocity, momentum, acceleration, and torque of moving or rotating objects;

6. explain and apply the principles of conservation of energy, linear and angular momentum;

7. describe the laws governing motion under gravity; and

8. explain motion under gravity and quantitatively determine behaviour of objects moving under gravity.

Course Contents

Space and time; units and dimension, Vectors and Scalars, Differentiation of vectors: displacement, velocity and acceleration; kinematics; Newton laws of motion (Inertial frames, Impulse, force and action at a distance, momentum conservation); Relative motion; Application of Newtonian mechanics; Equations of motion; Conservation principles in physics, Conservative forces, conservation of linear momentum, Kinetic energy and work, Potential energy, System of particles, Centre of mass; Rotational motion; Torque, vector product, moment, rotation of coordinate axes and angular momentum. Polar coordinates; conservation of angular momentum; Circular motion; Moments of inertia, gyroscopes, and precession; Gravitation: Newton's Law of Gravitation, Kepler's Laws of Planetary Motion, Gravitational Potential Energy, Escape velocity, Satellites motion and orbits.

PHY 102: General Physics II (Electricity & Magnetism) (2 Units C: LH 30)

Learning Outcomes

On completion, the students should be able to:

1. describe the electric field and potential, and related concepts, for stationary charges;

2. calculate electrostatic properties of simple charge distributions using Coulomb's law, Gauss's law, and electric potential;

3. describe and determine the magnetic field for steady and moving charges;

4. determine the magnetic properties of simple current distributions using Biot-Savart and Ampere's law;

5. describe electromagnetic induction and related concepts and make calculations using Faraday and Lenz's laws;

6. explain the basic physical of Maxwell's equations in integral form;

7. evaluate DC circuits to determine the electrical parameters; and

8. determine the characteristics of AC voltages and currents in resistors, capacitors, and inductors.

Course Contents

Forces in nature. Electrostatics (electric charge and its properties, methods of charging). Coulomb's law and superposition. Electric field and potential. Gauss's law. Capacitance. Electric dipoles. Energy in electric fields. Conductors and insulators. DC circuits (current, voltage and resistance. Ohm's law. Resistor combinations. Analysis of DC circuits. Magnetic fields. Lorentz force. Biot-Savart and Ampère's laws. Magnetic dipoles. Dielectrics. Energy in magnetic fields. Electromotive force. Electromagnetic induction. Self and mutual inductances. Faraday and Lenz's laws. Step up and step down transformers. Maxwell's equations. Electromagnetic oscillations and waves. AC voltages and currents applied to inductors, capacitors, and resistance.

PHY 107: General Practical Physics I   (1 Unit C: PH 45)

Learning Outcomes
On completion, the students should be able to:

1. conduct measurements of some physical quantities;

2. make observations of events, collect and tabulate data;

3. identify and evaluate some common experimental errors;

4. plot and analyse graphs; and

5. draw conclusions from numerical and graphical analysis of data.

Course Contents

This introductory course emphasises quantitative measurements, the treatment of measurement errors, and graphical analysis. A variety of experimental techniques should be employed. The experiments include studies of meters, the oscilloscope, mechanical systems, electrical and mechanical resonant systems, light, heat, viscosity, etc., covered in PHY 101, 102, 103 and PHY 104. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis, and deduction.

PHY 108: General Practical Physics II   (1 Unit C: PH 45)

Learning Outcomes
On completion, the students should be able to:

1. conduct measurements of some physical quantities;

2. make observations of events, collect and tabulate data;

3. identify and evaluate some common experimental errors;

4. plot and analyse graphs;

5. draw conclusions from numerical and graphical analysis of data; and

6. prepare and present practical reports

Course Contents

This practical course is a continuation of PHY 107 and is intended to be taught during the second semester of the 100 level to cover the practical aspect of the theoretical courses that have been covered with emphasis on quantitative measurements, the treatment of measurement errors, and graphical analysis. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis, and deduction.

BIO 101: General Biology I   **(2 Units C: LH 30)**

Learning Outcomes

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

1. explain cell structure and organizations;

2. summarize functions of cellular organelles;

3. characterize living organisms and state their general reproduction;

4. describe the interrelationship that exists between organisms;

5. discuss the concept of heredity and evolution; and

6. enumerate habitat types and their characteristics.

Course Contents

Cell structure and organisation, functions of cellular organelles. Characteristics and classification of living things. Chromosomes, genes; their relationships and importance. General reproduction. interrelationships of organisms (competitions, parasitism, predation, symbiosis, commensalisms, mutualism, saprophytism). Heredity and evolution (introduction to Darwinism and Lamarkism, Mendelian laws, explanation of key genetic terms). Elements of ecology and types of habitat.

BIO 102: General Biology II   **(2 Units C: LH 30)**

Learning Outcomes

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

1. list the characteristics, methods of identification and classification of viruses, bacteria and fungi;

2. state the unique characteristics of plant and animal kingdoms;

3. describe ecological adaptations in the plant and animal kingdoms;

4. explain nutrition, respiration, excretion and reproduction in plants and animals; and

5. describe growth and development in plants and animals.

Course Contents

Basic characteristics, identification and classification of viruses, bacteria and fungi. A generalized survey of the plant and animal kingdoms based mainly on the study of similarities and differences in the external features. Ecological adaptations. Briefs on physiology to include nutrition, respiration, circulatory systems, excretion, reproduction, growth and development.

BIO 107: General Biology Practical I   (1 Unit C: PH 45)

Learning Outcomes

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

1. outline common laboratory hazards;

2. provide precautions on laboratory hazards;

3. state the functions of the different parts of microscope;

4. use the microscope and describe its maintenance;

5. draw biological diagrams and illustrations; and

6. apply scaling and proportion to biological diagrams.

Course Contents

Common laboratory hazards. prevention and first aid. measurements in biology. uses and care of microscope. compound and dissecting microscope. Biological drawings and illustration, scaling, accuracy and proportion. use of common laboratory apparatus and laboratory experiments designed to illustrate the topics covered in **BIO 101.**

BIO 108: General Biology Practical II   (1 Unit C: PH 45)

Learning Outcomes

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

1. describe the anatomy of flowering plants;

2. differentiate types of fruits and seeds;

3. state ways of handling and caring for biological wares;

4. describe the basic histology of animal tissues; and

5. identify various groups in the animal kingdom.

Course Contents

Anatomy of flowering plants, primary vegetative body. stem, leaf and root to show the mature tissues namely parenchyma, collenchyma, sclerenchyma, xylem and phloem. Types of fruits and seeds. Care and use of dissecting kits and other biological wares. Dissection and general histology of animal tissues based on vertebrate forms. Morphology and functions of epithelial, muscular, nervous and connective tissues. Examination of various groups of lower invertebrates under microscopes, identification of various groups of organisms in Animal Kingdom and any experiment designed to emphasize the practical aspects of topics in BIO 102.

ZOO 101: The Mammalian Body (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, the students will be able to:

1. describe the basic anatomy and physiology of the mammalian body;

2. describe the external feature, muscular, digestive, circulatory and other organ systems of a mammalian body;

3. develop introductory knowledge about the role of zoology in human development by understanding relationships between organisms through systematics and cell biology;

4. describe eugenics and evolution; and

5. elaborate ecology.

Course Contents

The anatomy and physiology of the mammal and adaptation to the environment. External features, skin, skeletal and muscular systems. Digestion and absorption of food; nutrition. Gas exchange and transport. The blood and circulatory system. The kidney and homeostasis. Nervous and chemical coordination. Maturation, sexuality, and reproduction in man.

ZOO 102: Animal Diversity   (2 Units C: LH 15; PH 45)

Learning Outcomes

The students, at the end of the course, will be able to:

1. identify the animal diversity around us;

2. describe the underlying principles of the classification of animals and the terminology needed in classification;

3. compare the differences and similarities in the various aspects of classification; and

4. classify animals up to order using the six levels of classification.

Course Contents

Diversity of animal forms, structures, and functions. Multicellularity and development of embryonic layers; history of animal diversity, basis of categorization of the diversity of animals (symmetry, organization of tissues, body cavity, developmental mode, fate of blastopore); major feature of animal phylogenetics tree; introduction to animal systematic; geographical distribution of animal life and issues in the conservation of biodiversity with emphasis on Nigerian species. General classification of animal kingdom. - binomial nomenclature; international rules of zoological nomenclature (brief account); new trends in systematics: numerical taxonomy (Phenetics), cladistics (phylogenetic systematics), molecular systematics.

UI-ZOO 103; Introductory Ecology   (2 Units R: LH 30)

Learning Outcomes

At the end of this course, students will be able to:

1. discuss organism and its environment

2. explain biotic and abiotic factors

3. Explain production and population ecology, trophic levels

4. Discuss food chains and webs, population growth

5. Explain the impact of man on the environment

Course contents

The organism and its environment, biotic and abiotic factors.

Production and population ecology; Trophic levels, 1_o, 2_o, 3_o

production, Food chains and food webs, population growth. The

impact of man on the environment.

STA 111: Descriptive Statistics   (3 Units C: LH 45)

Learning Outcomes

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

1. explain the basic concepts of descriptive statistics;

2. present data in graphs and charts;

3. differentiate between measures of location, dispersion and partition;

4. describe the basic concepts of Skewness and Kurtosis as well as their utility function in a given data set;

5. differentiate rates from ratio and how they are use; and

6. compute the different types of index number from a given data set and interpret the output.

Course Contents

Statistical data. Types, sources and methods of collection. Presentation of data. Tables chart and graph. Errors and approximations. Frequency and cumulative distributions. Measures of location, partition, dispersion, skewness and Kurtosis. Rates, ratios and index numbers.