

FACULTY OF BASIC AND APPLIED SCIENCES

EXISTING ACADEMIC PROGRAMMES/DEPARTMENTS

- i. Biological Sciences Department
 - B. Sc. Biology
 - B. Sc. Microbiology
- ii. Chemical Sciences
 - B. Sc. Biochemistry
 - B. Sc. Chemistry
- iii. Mathematical Sciences
 - B. Sc. Computer Science
 - B. Sc. Mathematics
- iv. Physics
 - B. Sc. Physics

100L FIRST SEMESTER

COURSE CODE	COURSE TITLE	UNIT	STATUS	L	T	P
BIO 101	General Biology I	3	C	2	1	-
BIO 103	Practical Biology I	1	C	-	-	3
CHM 101	General Chemistry I	3	C	2	1	-
CHM 103	Practical Chemistry I	1	C	-	-	3
PHY 101	General Physics I	3	C	2	1	-
PHY 103	Practical Physics I	1	C	-	-	3
MTH 101	General Mathematics I	3	C	2	1	-
CSC 101	Introduction to Computer Science I	3	C	2	-	3

GST 101	Communication in English I	2	C	2	-	-
GST 103	Use of Library & Information literacy	1	C	2	-	-
GST 105	Citizenship and Leadership Education	1	C	2	-	-
GST 107	Communication in French I	1	C	-	-	3
GST 109	Introduction to Music I	0	C	0	0	3
TOTAL		22				

FIRST SEMESTER REQUIREMENTS

22 units of compulsory courses available

Registrable Units/Semester = Minimum 15 units

= Maximum 24 units

100L SECOND SEMESTER

COURSE CODE	COURSE TITLE	UNIT	STATUS	L	T	P
BIO 102	General Biology II	3	C	2	1	-
BIO 104	Practical Biology II	1	C	-	-	3
CHM 102	General Chemistry II	3	C	2	1	-
CHM 104	Practical Chemistry II	1	C	-	-	3

PHY 102	General Physics II	3	C	2	1	-
PHY 104	Practical Physics II	1	C	-	-	3
MTH 102	General Mathematics II	3	C	2	1	-
CSC 102	Introduction to Computer Science II	3	C	2	-	3
GST 102	Communication in English II	2	C	2	-	-
GST 106	Philosophy and Logic	2	C	2	-	-
GST 108	Communication in French II	C	1	-	-	3
TOTAL		23				

SECOND SEMESTER REQUIREMENTS

23 units of compulsory courses available.

Registrable Units/semester = Minimum 15 units

= Maximum 24 units

Course Description

GST 101 Communication in English I (Study Skills) (2 UNITS)

Introduction: the nature and functions of language, varieties and styles of English usage. Time Management. Study Skills: contemporary definition of literacy, introduction to the language skills. Vocabulary development: word formation, meaning relationships, register. Listening and Lecture

Comprehension. Note-taking/note-making. Introduction to Reading for Academic Purposes. Revision and Test-taking skills

30h (L); C

GST 102 Communication in English II: (2 UNITS)

Awareness raising: sources and types of writing errors. Grammatical structures: elements of the sentence. Word, phrase and clause. Sentence types: classification by structure and function. The paragraph: definition and characteristics, patterns of development. Varieties of writing: discourse types, writing formats. The Mechanics of writing. The academic writing processes.

30h (L); C

GST 103 Use of the Library (1 UNITS)

Definition and types of library. Example of a library set up (Introduction to the EUIM library). Organisation of a library. Forms of recorded information: print, non-print and electronic forms. Reference sources and services. Serials and periodicals. Use of ICT in the library. Internet applications: e-resources, social media networks, databases. Virtual libraries. Organisation and retrieval of knowledge. The library catalogues. Classification schemes. Introduction to report writing. Search strategies, referencing, referencing styles

15h (L); C

GST 104 History and Philosophy of Science (1 UNITS)

Origins and scope of science, nature and meaning of science, goals of scientific enquiry. The meaning and origin of philosophy, relationship between philosophy and science. The scientific revolution. Scientific approach to knowledge, the scientific method, matter: elements, compounds and mixtures, force and energy. Origin of life and evolution. Man and his cosmic environment, sky, solar and stellar systems. Space science and exploration. Energy resources and utilization, renewable energy, exploitation and conversion of natural resources. Science and technology, food processing and preservation. The ecosystem, Environmental degradation and pollution.

15h (L); C

GST 105 Citizenship and Leadership Education (2 UNITS)

Citizenship, qualities of a good citizen. Human rights, limitations to citizen's rights, protection of citizens' rights, Duties and Obligations: duties of citizens, obligations of citizens to the state. Moral principles and moral obligations. Drugs and medicines, drug abuse and its effects, drugs and health care, prescription and compliance, natural medicines and ethnotherapy. Family life education: reproductive health, harmful health practices safe motherhood, relationships and sexual behaviour. Concepts of health and disease: concepts of well-being and disease, disease causation, HIV/AIDS, transmission, prevention and control, stigmatization of PLWHA. Leadership, qualities of a good leader responsibility, Types of leadership, Leadership and Political Power; Goal setting, vision and mission, Delegation of duties

15h (L); C

GST 106 Philosophy and Logic (2 UNITS)

Philosophy as a rational enquiry, branches of philosophy, schools of thought in Western philosophy, African philosophy. The nature of logic, basic symbolic logic, Types of argument. Fallacies. Ethics. Contemporary ethical problems. Introduction to metaphysics, metaphysical problems. Socio-political philosophy. Justice and the State. *30h (L); C*

GST 107: Communication in French I**(1 Unit)**

This course is an introduction to basic skills in French language as a means of communication. These skills are practically introduced in their usage for the oral and written communication, beginning from the French alphabets and sounds in contrast to those of English. Also, Communication in French will bring to the students basic grammatical elements that make for intelligibility in the language such as the use of articles determined by gender and number, conjugation of verbs for sentence construction. They are also to be guided in the reading and comprehension simple texts in French.

*15h (L); C***GST 108: Communication in French II****(1 Unit)**

Course Description: The main objective of this course is to build on the background of the basic communication skills laid in GST 107. The course further emphasizes the practical use of French language the by students. This objective is to be attained by facilitating students' ability to read French texts and encourage free communication in the language both in the oral and written skills. Practical exercises are part of the engagements through the listening and the speaking skills.

*15h (L); C***GST 109 Introduction to Music I****(2 UNITS)**

Elements of music; rhythm combination and extension. Choral singing, ensemble work and special instrument (including voice).

*45h (P); C***BIO 101 General Biology 1 3 units**

The scope of Biology and its place in human welfare including characteristics of life, concepts in biology, topical issues in biology and career opportunities, Characteristics and classification of living things, Cell structure and organization; functions of cellular organelles, Cell division (Mitosis/Meiosis), Hereditary and evolution, Differences between plants and animals, Diversity and life cycles of plants to include algae, fungi, bacteria, viruses, bryophytes, Pteridophytes, gymnosperms and angiosperms.

BIO 102 General Biology II 3 Units

A survey of the similarities and differences in external features of the Animal Kingdom, Forms, Functions and Evolutionary studies of Protozoans, Coelenterates, Platyhelminthes, Nematodes, Annelids, Arthropods, Molluscs, Echinoderms, Proto-chordates and different classes of vertebrates, Introduction to ecology (aim and scope) and basic units of ecology (Individual, Population, Community and Ecosystems), Biotic and Abiotic components of an ecosystem, Energy flow and Nutrient recycling.

BIO 103 Practical Biology I 1 Unit

Laboratory demonstrations using models on cell division (Mitosis/Meiosis), Detail analysis of morphological features of some plants. Cytological Techniques: Preparation of slides and staining techniques. Microscopic examination of details morphology of Fungi, Bacteria, Algae and Bryophytes. Examination of specific examples of gymnosperms and angiosperms. Diagrams of representative specimens of a named Pteridophytes. Guidelines for Biological drawings

BIO 104 Practical Biology II 1 Unit

General laboratory procedures, Diversity of living things, Animal cells including skin and epithelia cells, Embryology (details of structure of eggs and sperms), Detailed structures of representative/named specimens of a. Protozoans, b. Coelenterates, c. Platyhelminthes, d. Nematodes, e. Annelids, f. Arthropods. Dissection of insects, lizards and toads. Animal classification. Population sampling and estimation (use of quadrat). Collection and preservation of insects, lizards, toads etc.

CHM 101 – GENERAL CHEMISTRY I (3UNITS)

Atoms, atomic structures, atomic theory, atomic spectra, aufbau method, Hund's rule, Pauli Exclusion principles, Periodicity and periodic table, molecules, chemical equation and stoichiometry, chemical reaction, energetics, Chemical bonding, Radioactivity; Chemical equilibrium reactions, Properties of gases, solutions, Electro chemistry, electrode potential, half-cell equation.

CHM 102 – GENERAL CHEMISTRY II (3 UNITS)

Historical survey of the development and importance of organic chemistry, nomenclature and classes of organic compounds, Homologous series; isolation and purification of organics compounds; qualitative and quantitative organic chemistry; stereochemistry; determination of structure of organic compounds; Electronic theory in organic chemistry; Saturated hydrocarbons and Unsaturated hydrocarbons; alkenes, alkynes and aromatics. Functional group; carbonyls, halides, carboxylic acids and hydroxyl, Valence Forces; structure of Solids; molecular and ionic forces. The Chemistry of selected metals and non- metals Quantitative analysis.

CHM 103 – PRACTICAL CHEMISTRY I

Calibration of Measuring Instrument; Standardization of HCl with Standard Sodium carbonate; Determination concentrations of commercial (H_2SO_4 ; HNO_3 ; NaOH); Preparation of a Sulphide of Copper and determination of its Electrical Formula; Preparation of Another sulphide of copper and comparison with previous one; Determination of the atomic weight of a metal by forming its Oxides; Determination of atomic weight of a metal from the volume of Hydrogen it displaced from an acid; preparation of double salts; determination of heat of neutralization; determination of Faraday's constant.

CHM 104 – PRACTICAL CHEMISTRY II

Identification of elements in an organic compound Lassaigne: sodium fusion Test; Ignition Tests; Separation of mixtures; determination of Melting points; Re-crystallisation; Simple experiment reactions of Urea (carbamide); Test for aldehydes; Detection of carbonyl group.

CSC101 Introduction to Computer Science

3 units

History of computers; functional components of a computer; characteristics of a computer system. Broad introduction to programming methodology and algorithm. Emphasis is on problem

solving strategies and techniques for developing/documenting applications, including principles of structured programming, problem decomposition, program organisation, the use of procedural abstraction and basic debugging skills. Java programming language serves as the vehicle to illustrate the many concepts.

CSC102 – Introduction to Computing (3 units)

Prerequisite: CSC101

Introduction to concepts of programming logic, principles and techniques. Study and use of the Microsoft office productivity suite with an emphasis on database design and development. Introduction to VBA programming languages and development of customised solutions for business and personal needs. Introduction to programming VB .NET – Introduction, the VB .NET language, the .NET framework, developing desktop applications, controls, common dialogue boxes and menus, developing browser-based applications, web services, ADO .NET – developing database applications.

MTH 101 GENERAL MATHEMATICS I: (3 Units)

(Algebra and Trigonometry)

Elementary set theory, subsets, union, intersections, complement, 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. Re Moivre's theorem, nth roots of unity. Circular measure, trigonometric functions of angles of any magnitude, addition and factor formulae.

MTH 102 GENERAL MATHEMATICS II: (3 Units)

Calculus: Function 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 integral. Application to areas, volumes etc.

MTH 106 STATISTICS FOR PHYSICAL SCIENCES AND ENGINEERING: (3 Units)

Measure of location and dispersion in simple and grouped data, Elements of probability and probability distribution, normal, binomial, Poisson, geometric, Negative binomial distribution. Estimation and tests of hypothesis concerning the parameters f-distribution. Regression, correlation and analysis of variance, contingency table Non-parametric inference.

PHY 101 – GENERAL PHYSICS I (2 UNITS)

Space and time, frames of reference, invariance of physical laws, length, units and dimension; standards and units, unit consistency, and unit conversions. Vectors, vector addition, component vectors, components of vectors, unit vectors, dot products of vectors, and cross product of vectors. Displacement, average and instantaneous velocity, average and instantaneous acceleration, motion with constant acceleration, freely falling bodies, position and velocity vectors, acceleration vector, projectile motion. Motion in a circle and relative velocity. Forces and interactions, Newton's first law, Newton's second law,

mass and weight, Newton's third law. Statics and dynamics: application of Newton's laws, dynamics of particles, frictional forces, dynamics of circular motion. Galilean invariance, universal gravitation, gravitational potential energy, elastic potential energy, conservative and non-conservative forces. Work and energy, kinetic energy and the work-energy theorem, power, momentum and impulse, conservation of momentum, collisions and momentum conservation, elastic collisions, centre of mass. Rotational dynamics and angular momentum angular velocity and acceleration, energy in rotational motion, parallel axis theorem, torque, torque and rotation about a moving axis, simple harmonic motion and its applications. The simple pendulum, damped oscillations, forced oscillations and resonance.

PHY 102 – GENERAL PHYSICS II (2 UNITS)

Electrostatics: conservation law of electric charges, electrons and electrostatics, Coulomb's law, electric field and forces, electric field line, electric dipoles charged particles in an electric field, charge and electric flux, Gauss's law and its applications, electric potential, electric potential due to a single charge, electric potential due to a dipole, electric potential due to continuous charge distribution equipotential surfaces. Conductors and currents: electric current, resistors and resistance, electric power, capacitors in series and parallel, energy storage in capacitors and electric field energy, Gauss's law in dielectrics. Magnetism: magnetic field, magnetic field lines and magnetic flux, motion of a charged particles in a magnetic field, magnetic force on a current carrying conductor, Ampere's law, Biot-Savart law, electromagnetic induction, inductance, self-inductance, mutual inductance, Maxwell's equation, electromagnetic waves and oscillations.

PHY 103/104 – PRACTICAL PHYSICS I/II (1 UNIT EACH)

This introductory course emphasizes quantitative measurements, the treatment of measurement errors and graphical analysis. A variety of experimental techniques will be employed. Experiments include: mechanics: timing experiments, simple pendulum, compound pendulum, measurement of gravitational acceleration, moments, determination of moment of inertia, measurement of viscosity, use of force board, law of momentum. Optics: reflection using plane mirror, convex/concave mirror, concave/convex lens, refraction using a prism, critical angle, apparent depth/real depth, simple microscope, compound microscope. Electricity: Ohm's law, heating effect of a current internal resistance of a cell, Metre/Wheatstone bridge, measurements using a potentiometer, mapping magnetic field. Heat: measurement of specific capacity of water, and a solid, expansion of gas experiment using a long capillary tube, Joule's law. Sound: resonance tube, Sonometer.

PHY 106 – GENERAL PHYSICS III (2 Units)

Pre-requisite – PHY 101

Molecular treatment of properties of matter, elasticity; Hooke's Law. Young's shear and bulk moduli. Hydrostatics; pressure; buoyancy. Archimedes' Principle. Hydrodynamics; streamlines, Bernoulli and continuity equations. Turbulence, Reynold's number. Viscosity; laminar flow, Poiseuille's equation. Surface tension; adhesion, cohesion, capillarity, drops and bubbles. Temperature; the zeroth law of thermodynamics; heat; gas laws of thermodynamics; Kinetic theory of gases. Applications.

