

DEPARTMENT OF PLANT BIOLOGY
ACADEMIC PROGRAMME

Detailed Course Contents

100 level

GST 111: Communication in English

Credits

2

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.

30hrs (T), C

GST 112: Nigerian People and Culture

Credits

2

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 movement and struggle for independence). Nigeria and challenges of nation building (military intervention in Nigerian politics; Nigerian Civil War). Concept of trade and economics of selfreliance (indigenous trade and market system; indigenous apprenticeship system among Nigeria 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 Nigeria 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 Reorientation; Reorientation 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.

30hrs (T), C

COS 101: Introduction to Computing Sciences

Credits

3

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.

30hrs (T), 45 (P), C

BIO101: General Biology

Credits

2

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

30hrs (T), C

BIO 102: General Biology II

Credits

2

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.

30hrs (T), C

BIO 107: General Biology Practical I

Credits

1

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.

45hrs (T), C

BIO 108: General Biology Practical II

Credits

1

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.

45hrs (T), C

BOT 102: Introductory Botany

Credits

2

General classification of plants. Distinguishing features of Monocotyledons and Dicotyledons. Features of vascular plant, Morphology of non-vascular plants. Duration of life of plants. Plants life cycles. Growth forms of plants. Cell structure and functions. Morphology of flowering plants, primary vegetative body: stem, leaf and root to show the mature tissues of parenchyma, collenchyma, sclerenchyma, xylem and phloem. Types of fruits and seeds. Botanical drawings and use of microscope

15 hrs (T), 45hrs (P), R

CHM 101: General Chemistry I

Credits 2

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.

30hrs (T), R

CHM 102: General Chemistry II

Credits 2

Historical survey of the development and importance of organic chemistry, fullerenes as fourth allotrope of carbon, uses as nanotubules, nanostructures and nanochemistry. 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.

30hrs (T), R

CHM 107: General Chemistry Practical I

Credits 1

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.

45hrs (T), R

CHM 108: General Chemistry Practical II

Credits 1

The course is a continuation of CHM 107. Additional laboratory experiments to include functional group analysis, quantitative analysis using volumetric methods are treated,

45hrs (T), R

MTH 101: Elementary Mathematics I (Algebra and Trigonometry)

Credits 2

Elementary set theory, subsets, union, intersection, complements and venn diagrams. Real numbers, integers, rational and irrational numbers, mathematical induction, real sequences and

series, theory of quadratic equations and 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.

30hrs. (T), R

MTH 102: Elementary Mathematics II (Calculus)

Credits 2

The deal with the 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 integrals. application to areas, volumes.

30hrs. (T), R

PHY 101: General Physics I (Mechanics)

Credits 2

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.

30hrs (T), R

PHY 102: General Physics II (Electricity & Magnetism)

Credits 2

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.

30hrs (T), R

PHY 107: General Practical Physics I

Credits

2

This introductory course emphasizes quantitative measurements, the treatment of measurement errors, and graphical analysis. It also discusses variety of experimental techniques that 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 and analysis and deduction.

45hrs. (T), R

PHY 108: General Practical Physics II

Credits

1

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.

45hrs. (T), R

ZOO 102: Animal Diversity

Credits

2

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.

15hrs (T), 45hrs (P), R

200 Level

GST 212: Philosophy, Logic and Human Existence

Credits

2

Scope of philosophy; notions, meanings, branches and problems of philosophy. Logic as an indispensable tool of philosophy. Elements of syllogism, symbolic logic— the first nine rules of inference. Informal fallacies, laws of thought, nature of arguments. Valid and invalid arguments, logic of form and logic of content — deduction, induction and inferences. Creative and critical thinking. Impact of philosophy on

human existence. Philosophy and politics, philosophy and human conduct, philosophy and religion, philosophy and human values, philosophy and character molding, etc.

30hrs (T), R

ENT 211: Entrepreneurship and Innovation

Credits

2

Concept of entrepreneurship (entrepreneurship, intrapreneurship/corporate entrepreneurship,). Theories, rationale, and relevance of entrepreneurship (Schumpeterian and other perspectives, risk-taking, necessity and opportunity-based entrepreneurship and creative destruction).

Characteristics of entrepreneurs (opportunity seeker, risk-taker, natural and nurtured, problem-solver and change agent, innovator, and creative thinker). Entrepreneurial thinking (critical thinking, reflective thinking, and creative thinking). Innovation (Concept of innovation, dimensions of innovation, change and innovation, Knowledge, and innovation). Enterprise formation, partnership, and networking (basics of business plan, forms of business ownership, business registration and forming alliances and joint ventures). Contemporary entrepreneurship issues (knowledge, skills and technology, intellectual property, virtual office, networking).

Entrepreneurship in Nigeria (Biography of inspirational entrepreneurs, youth and women entrepreneurship, entrepreneurship support institutions. Youth enterprise networks and environmental and cultural barriers to entrepreneurship). Basic principles of e-commerce.

15hrs (T), 45 (P), R

BIO 201: Genetics I

Credits

2

Hereditary and non-hereditary characteristics. Probability and tests of goodness of fit. Quantitative inheritance. Variation in genome structure. Introduction to population genetics.

30hrs (T) C.

BIO202: Introductory Ecology

Credits

2

Concept and definition of ecosystem, ecology at community level, ecological classification of habitat types, terrestrial and aquatic biomass, specific features of each, biotic components of habitat. Natural destruction, factors of communities, success of community interaction, natural cycle, dynamics of population.

15hrs (T), 45 hrs(P), C

BIO 203: General Physiology

Credits

Chemicals of life: the chemistry of carbohydrates, lipids, proteins and nucleic acids and their biological importance. General characteristics of enzymes. Nutrition, digestion and absorption in plants and animals. Biosynthesis, photosynthesis and protein synthesis. Cell membrane structure and function. A general study of osmoregulation, excretion, transport, growth hormones and enzymology, homeostasis and their co-ordination in animals. Plant water relation, growth and growth regulation.

30hrs (T) C.

BIO 204: Biological Technique

Credits

2

Microscopy. Handling of microscopes. Preparation of microscope slides (microtomy) for microscopic examinations. Use of hand lens. Biological drawings and diagrams. Spectrophotometry. Colorimetry. Photometry. Polarimetry. Chromatography. Refractometry. Melting points and colligative properties. Herbarium and museum techniques. Experimental designs, report writing and presentations.

15hrs (T), 45hrs(P), C

BIO 205: Introductory Developmental /Cell Biology

Credits

2

History and present trends in cell biology. Ultra-structure of the plant and animal cells, Organelles and their basic structures and functions; mitosis and meiosis, cell differentiation and growth of cells. A brief study of the molecular basis of cell structure and development.

15hrs (T), 45hrs (P), C

BOT 202: Seedless Plants

Credits

2

Morphology and reproduction of fungi. Morphology and reproduction of algae. Morphology and reproduction of bryophytes and pteridophytes. Classifications of fungi, Algae, bryophytes and pteridophytes. General characteristics of fungi, algae, bryophyte and pteridophytes. A study on fossils of fungi, algae, bryophytes and pteridophytes. Evolutionary sequences of the members of Thallophytes (Bacteria, fungi and bryophytes and pteridophytes).

30hrs 9T), C

BOT 203: Seed Plants

Credits

2

Characteristics of gymnosperm. Morphology of stem of gymnosperms, Morphology of roots of gymnosperms. Morphology of leaves of gymnosperms. Morphology of flowers of gymnosperms. Reproduction in gymnosperms. Classification and distribution gymnosperms. Characteristics of angiosperm. Morphology of monocotyledons, Morphology of dicotyledons. Reproduction and reproductive parts of Monocotyledons. Reproduction and reproductive parts of dicotyledons. Fossil plants in gymnosperms and angiosperms.

30Hrs (T), C

BOT 299: Industrial Attachment I

Credits

3

Students should be attached to industrial organisations for 12 weeks for appropriate exposure. Assessment to be based on written report, seminar presentation and referees' assessment.

12 weeks (IA), C

UIL-BOT204: Botany in Landscaping and Range Management

Credits

3

Meaning and principle of landscaping. Types of landscapes and landforms. Elements of landscaping. Hardscaping and softscaping landscapes. Components of softscape landscaping. Meaning and principles of range and range management. Types of range. Characteristics of rangeland. Management strategies for rangeland. Botanical characteristics of hedges and ornamental plants. Definition of botanical garden. Purpose of creating botanical garden. Design of botanical gardens. Uses of botanical gardens. Plants in interior decoration and lawn maintenance. Site survey and analysis. Potential of floriculture industry in Nigeria. Cut flowers of commercial importance to export markets.

30hrs (T), 45hrs (P), C

UIL-BOT205: Biometry

Credits

2

Development of biometry. Applications and limitations of biometry. Data in biology. Samples and populations. Research variables in biology. Concept of accuracy and precision. Measures of location. Measures of spread or dispersion. Coding of data. Probability distributions (binomial, negative binomial, poisson, normal distributions). Distribution and variances of means, and confidence limits. Introduction to experimental design. Hypothesis testing. Analysis of variance (ANOVA). Correlation and Regression. Analysis of Frequency. Test of Goodness of Fit. Test of Independence.

15hrs (T), 45hrs (P), C

BCH 202: General Biochemistry II (

Credits

2

The cell theory. Structures and functions of major cell components. Cell types, constancy and diversity. Cell organelles of prokaryotes and eukaryotes. Chemical composition of cells. Centrifugation and methods of cell fractionation. Structure, function and fractionation of extracellular organelles. Water, total body water and its distribution. Regulation of water and electrolyte balance. Disorder of water and electrolyte balance. Acidity and alkalinity, pH and pK values and their effects on cellular activities.

30hrs (T), R

CHM 211: Organic Chemistry I

Credits

2

Chemistry of aromatic compounds. Structures of simple sugars, starch and cellulose, peptides, and proteins. Chemistry of bifunctional compounds. Energetics, kinetics, and the investigation of reaction mechanisms. Mechanisms of substitution, elimination, addition, and rearrangement reactions. Stereochemistry. Examples of various named organic reactions e.g., Grignard reaction, Aldol and related reactions. Simple alicyclic carbon compounds and their synthesis.

30hrs(T), R

CHM 212: Inorganic Chemistry I

Credits

2

Chemistry of first row transition metals. Introduction to coordination chemistry including elementary treatment of crystal field theory. Comparative Chemistry of the following elements:

(a) Ga, In, Tl, (b) Ge, Sn, Pb, (c) As, Sb, Bi (d) Se, Te, Po.

Elementary introduction to organometallic chemistry. Role of metals in biochemical systems. Concepts of hard and soft acids and bases. Oxidation and reduction reactions.

CHM 213: Analytical Chemistry I

Credits

2

Theory of errors; and statistical treatment of data: Theory of sampling. Chemical methods of analysis including volumetric, gravimetric, data analysis. Presentation and physicochemical methods. Optical methods of analysis; separation methods.

30hrs(T), R

ZOO 211: Invertebrate Zoology I

(2 Units C: LH 15; PH 45)

Credits

2

The systematics, inter-relationship, and basic organization of the lower invertebrates, of the Phylum Protozoa, Porifera, Coelenterate, Platyhelminths, Nematoda, Entoprocta, Nemertinea, Acanthocephala, and Rotifera

15hrs (T), 45hrs (P), R

300 level

GST 312: Peace and Conflict Resolution

Credits

2

Concepts of peace, conflict and security in a multi-ethnic nation. Types and theories of conflicts: ethnic, religious, economic and geo-political conflicts. Structural conflict theory, realist theory of conflict and frustration-aggression conflict theory. Root causes of conflict and violence in Africa: indigene and settlers' phenomenon, boundaries/boarder disputes, political disputes, ethnic disputes and rivalries, economic inequalities, social disputes, nationalist movements and agitations, selected conflict case studies – Tiv-Junkun, Zango Kartaf, chieftaincy and land disputes and many more. peace building, management of conflicts and security, peace & human development. Approaches to peace & conflict management: (religious, government, community leaders and many more.). Elements of peace studies and conflict resolution, conflict dynamics assessment scales: constructive & destructive. Justice and legal framework and concepts of social justice. The Nigeria legal system. Insurgency and terrorism. Peace Mediation and Peace Keeping. Peace and security council (international, national and local levels). Agents of conflict resolution: conventions, treaties, community policing, evolution and imperatives. Alternative dispute resolution (ADR): a). dialogue b). arbitration c). negotiation d). collaboration and many more Roles of international organizations in conflict resolution: (a). The United Nations (UN) and its conflict resolution organs. (b). The African Union & Peace Security Council (c). ECOWAS in peace keeping. Media and traditional institutions in peace building. Managing post-conflict situations/crisis: refugees. internally displaced persons (IDPs). The role of NGOs in post-conflict situations/crisis.

30hrs (T), R

ENT 312: Venture Creation

Credits

2

Opportunity identification (sources of business opportunities in Nigeria, environmental scanning, demand and supply gap/unmet needs/market gaps/market research, unutilised resources, social and climate conditions and technology adoption gap). New business development (business planning and market research). Entrepreneurial finance (venture capital, equity finance, micro finance, personal savings, small business investment organisations and business plan competition). Entrepreneurial marketing and e-commerce (principles of marketing, customer acquisition & retention, B2B, C2C and B2C models of e-commerce, first mover advantage, e-commerce business models and successful e-commerce companies). Small business management/family business, leadership & management, basic bookkeeping, nature of family business and family business growth model. Negotiation and business communication (strategy and tactics of negotiation/bargaining, traditional and modern business communication methods). Opportunity discovery demonstrations (business idea generation presentations, business idea

contest, brainstorming sessions, idea pitching). Technological solutions (the concept of market/customer solution, customer solution and emerging technologies, business applications of new technologies - *Artificial Intelligence (AI)*, *Virtual/Mixed Reality (VR)*, *Internet of Things (IoTs)*, *Blockchain*, *Cloud Computing*, *Renewable Energy*, *Digital Business and E-Commerce Strategies*).

15hrs(T), 45hrs (P) C

BOT 301: Plant Taxonomy

Credits

3

Taxonomy and its significance, principles and concepts in plant taxonomy. Construction and use of taxonomic keys. Experimental taxonomy with special emphasis on cytotaxonomy and chemotaxonomy. Sources of taxonomic data and methods of analysis. Artificial systems, natural systems phylogenetic system, binomial nomenclature, International rules of botanical nomenclature. General principles of classification of flowering plants. Some unconventional identification methods. Polyclave identification, computerized identification. Methods of describing a flowering plant, floral formulae, floral diagram, classification.

30hrs (T), 45hrs (P), C

BOT 302: Comparative Anatomy of Plants

Credits

3

Characteristics and classification of tissue and tissue systems; organization of meristems, evolution of vascular tissues, comparative wood anatomy. Anatomical adaptations to specialized habitats. Applied aspects of plant anatomy. Anatomy of monocot and dicot stems, roots and leaves. Anomalous secondary growth.

30hrs (T), 45hrs (P), C

BOT 303: Plant Physiology

Credits

3

Plant water relation, photosynthesis, photosynthetic pigments, photochemical reaction centre, phosphorylation, Calvin cycle, Photorespiration, Crassulacean Acid metabolism, glycolysis, respiration, growth and growth regulation, flowering, dormancy, seed germination, senescence; Properties of water in relation to plant life. Transpiration. Factors affecting transpiration. Mineral nutrition. Mineral elements and their functions. Physiological aspects of crop yield. Pre-requisite -B10203.

30hrs (T), 45hrs (P), C

BOT 304: Plant Ecology

Credits

3

Study of various plant communities and their ecological framework; Nigerian vegetation, desert and semi-desert plant productivity. Modern concepts in ecology.

15hrs (T), 90hrs (P), C

BOT 305: Mycology

Credits 3

Fungal morphology-structure of septate and coenocytic fungi. Fungal cytology. Different lifecycles in fungal groups, Fungal physiology. Classification of fungi. Fungal nomenclature. Characteristics of fungi. Fungi of economic importance. Metabolites of fungi, industrial uses of fungi. Fungi in medicine.

30hrs (T), 45hrs (P), C

BOT 306: Plant Breeding

Credits 3

The objectives of plant breeding; origin and domestication of plant breeding. Self-pollinated and cross-pollinated crops. Breeding methods, pure line breeding and mass selection; pedigree method; bulk population breeding; backcross breeding. Recurrent selection, chromosome manipulation.

15hrs (T), 90hrs (P), C

BOT 311: Medicinal Plants

Credits 3

Description, identification and classification of medicinal plants. Preparation of extracts from various organs of plants. Gathering of ethnomedical information. Collection and preservation of medicinal plant. Importance of medicinal plants. Pharmacological properties of medicinal plants. Biodiversity convention–Rio, Glasgow and many more.

15hrs (T), 90hrs (P), C

BOT 312: Conservation and Biodiversity

Credits 3

Plant breeding concepts and methods. Development of conservation movement, scope of conservation, strategy for conservation, man, nature and resources, principles of paces, grasslands, man's use of forestry.

30hrs (T), 45hrs (P), C

BOT 399: Industrial Attachment II

Credits 3

Industrial/Field experience in anyone of the following: (a) Afforestation; (b) Applied Plant Anatomy; (c) Aquatic and Pollution Biology; (d) Horticulture; and (e) Biotechnology for a period of three months preferably during the long vacation. Students will be assessed based on seminar presentations, their reports and supervisors' assessments.

12 weeks (IA), C

UIL-BOT 308: Introductory Cytogenetics and Genetic Analysis

Credits

2

Cytological techniques. Maintenance of cytological materials. Collection and analysis of cytological data. Pretreatment drugs. Fixatives and hydrolysing agents. Documentation of cytological data. Evolution of chromosomes and genetic systems. Mechanisms of genetic change. Gene mutations. Chemical basis of gene mutation. Chromosomal mutations. Genetical and cytological consequences of mutations. Chromosomal basis of Mendelian genetics. Derivations from Mendelian genetics. Gene interactions. Population genetics. Population in equilibrium.

30hrs (T), 45hrs(P), C

UIL-BOT 310: Field Trip

Credits

Vegetation types: floristic and physiognomy. Human impacts on the vegetation. Afforestation practices and impact. Conservation of biodiversity. Collection and preservation of plant samples. Assessment and report writing.

90hrs (P)

UIL-BOT 313: Algology

Credits

2

Features of algae. Prokaryotic and eukaryotic algae. Features used for algal classification. Morphological forms of algae. Algal divisions. Reproductive structures. Asexual reproductive strategies. Sexual reproduction. Life cycles of algae. Ecological distribution. Importance of algae in agriculture. Algal products and their industrial uses. Algae and water ecosystem. Algae as bio-monitors of the aquatic ecosystem. Algal relationships with other plants. Roles of algae in biogeochemical cycles. Algae as environmental nuisance. Culture of algae.

15hrs (T), 45hrs (P) C

UIL-BOT 314: Introductory Plant Pathology

Credits

3

Concepts of plant pathology. History of plant pathology. Objectives/aims of plant pathology. Significance of plant pathology. Scope of plant pathology. Common terminologies in plant pathology. Phytopathogens. Classification of phytopathogens. Causes of plant diseases. Disease triangle and its modification. Conditions for disease development. Disease symptoms and signs. Laboratory techniques involved in plant pathology. Identification of phytopathogens. Epiphytotics. Plant disease forecasting. Introduction to molecular plant pathology.

30hrs (T), 45hrs (P), C

UIL-BOT 315: Bryology

Credits

2

Origin of bryophytes. General features of bryophytes. Classification of bryophytes. Anthocerotophyta. Hepaticophyta/Marchantiophyta. Bryophyta. Growth forms. Water relations. Mineral relations. Asexual reproduction. Phenological study. Sexual reproduction. Life cycle of bryophytes. Ecological distribution. Survival strategies of bryophytes. Bryophytes as bio-indicator and bio-monitors. Culture of bryophytes. Bryophytes as reservoirs of bioactive compounds.

15hrs (T) 45hrs (P)

UIL-BOT 317: Plant Biochemistry

Credits

2

Important nature of enzymes. Factors affecting enzyme action. Enzyme kinetic and regulation. Enzyme classification. Role of enzymes in industry. Photosynthetic pigment and active specimen. Light reaction (cyclic and non-cyclic phosphorylation). Biochemical pathways in C3 (Calvin cycle) C4 and CAM plants. Synthesis of macromolecules. Aerobic and anaerobic respiration. Role of fermentation in industry. Carbohydrate metabolism with emphasis on glycolysis and Krebs's cycle. Energy sheet in aerobic respiration. Lipid classification and their roles. Lipid synthesis. Types of secondary metabolites. Uses of secondary metabolites.

15hrs (T), 45hrs (P), C

UIL-BOT 318: Pteridology

Credits

2

Features of pteridophytes. Heterospory. Pteridophytes as higher and vascular cryptogams. Relationship with bryophytes and seed plants. Classification of pteridophytes. Eusporangiates. Leptosporangiates. Royal ferns. Water ferns. True ferns. Ecological distribution. Reproductive strategies. Life cycles. Survival strategies. Pteridophytes as reservoirs of bioactive compounds. Importance of pteridophytes in landscaping. Culture of pteridophytes

15hrs (T), 45hrs (P), E

UIL-BOT 319: Plant and Water Relations

Credits

2

Water content cell. Properties of water. Diffusion. Osmosis. Matric force. Cell water potential. Solute potential. Pressure potential. Turgor pressure. Plasmolysis. Transpiration. Transpiration pull. Importance of transpiration. Wilting. Absorption and transport of water. Diffusion Pressure Deficit. Stomata. Leaf and stem modification.

15hrs (T), 45hrs (P), E

400 Level

BOT 401: Seminar

Credits 1

Student reports on an assigned or chosen current topic in botany. Review of literature on the assigned topic should be included.

45hrs (P), C

BOT 402: Economic Botany

Credits 2

A study of the botany, cultivation, processing and uses of tropical plants with particular references to Nigerian economic plants will be undertaken. Plants producing oils, rubber and wood products, fibres, dyes and leather tanning materials, sugar and pharmaceutical products.

30hrs (T), C

Bot 403: Nigerian Vegetation

Credits

A study of Nigerian vegetation types: mangrove, swamp forest, fresh water swamp forest, savannah grasslands and arid zones. The impact of human activities on Nigerian vegetation.

30hrs (T), C 2

BOT 404: Soil Sciences

Credits 3

Classification and characteristics of soils. Chemical component and analysis of soils and plant tissue. Plant, soil water relationships.

30hrs (T) 45hrs(P), C

BOT 406

Credits 3

Principles and concepts in plant pathology. The concept of disease, infection, pathogenesis, host-pathogen relationship. Methods and theory of biological therapy and chemotherapy. Disease inciting organisms. Symptoms of plant diseases. Defence mechanisms. Principles of plant disease control. Methods of

studying plant diseases. Biopesticides in diseases management. The method of studying nematodes diseases of plants.

30hrs (T) 45hrs(P), C

BOT 407: Plant Reproduction

Credits

3

Development trends of sexual and asexual reproduction to be studied. Structure and functions of nucleus, mechanisms of cell division, mitosis and meiosis in plant reproduction. Sexual reproduction in flowering plants, emphasis on floral structure and functions (Gynoecium and Androecium), pollination, fertilization, seed and fruit formation, dispersal, seed germination, seed dormancy, mechanisms of breaking seed dormancy, physiological implications, conditions necessary for germination, seed storage and propagation. Asexual reproduction: clones, fission, spore formation, fragmentation. Vegetative propagation of horticultural tree crops. Current techniques in bud grafting and cutting.

45hrs (T), C

BOT 408: Plant Tissue Culture

Credits

Meristem culture, organ cultivation, embryo culture. The role of plant hormones and vitamins. Techniques of plant tissue culture. Applications of plant tissue culture in plant breeding.

15hrs (T), 90hrs (P) C

3

BOT 409: Plant Virology

Credits

3

General characteristics of plant viruses. Viral multiplication. Selected viral diseases in plants. Origin of viruses, general morphology of viruses. Classification and nomenclature. Replication of bacteriophages. Types of viral infection. Common symptoms of viral infection. Transmission of viruses. Control strategies. Nature of viruses.

30hrs (T), 45hrs (P) C

BOT 111: Bioinformatics

Credits

3

Introduction to Internet, world wide web Internet resources, browsers, search engines, PubMed, Biological databases, and its retrieval. Nucleotide sequence databases and analysis, genes and genome, prokaryotic and eukaryotic genes. Genbank entry and genome database, organelle genome. Gene

identification with internet recourse. Sequence alignment and construction of phylogenetic trees. Gene Predictions.

45hrs (T), C

BOT 413: Research Project

Credits

6

Research findings into selected topics in Botany. Students will be expected to carry out literature survey on chosen topics, perform experiments and produce reports. Students will be subjected to both seminar and oral examinations on their projects.

270hrs (P), C

BOT 414: Plant Molecular Biology

Credits

3

Fundamental and applied aspects of plant molecular biology, structure, expression and isolation of plant nuclear genes. Biogenesis of microtubule, microfilaments. Golgi apparatus and mitochondria. Membrane and membrane interactions. Cell wall structure and properties of DNA and RNA. Molecular biology of plant development, plant organelles and plant-microbe interactions and plant biotechnology.

45hrs (T), C

BOT 415: Palaeobotany and Palaeontology

Credits

Morphology and classification of spores and pollen; their stratigraphic occurrence. Palaeo climate and palaeo environment. Biozones. Application of pollen and spores to hydrocarbon exploration

45hrs (T), C

BOT 416: Plant Cytogenesis

Credits

3

Morphology and behaviour of chromosomes, Chromosomal Aberrations and Polyploidy, importance of polyploidy, Population cytogenesis. Examples with reference to specific individuals. Population cytogenesis, Hardy-Weinberg law. Gene recombination, elementary probability and testing genetic ratios. Modern application of genetics, objectives and origin of plant breeding.

30hrs (T), 45hrs (P), C

BOT 417: Plants and Environmental Pollution Monitoring

Credits

3

The use of algae, lichens, bryophytes and higher plants in monitoring environmental pollution. The use of algae as indicators of aquatic pollution. The merits and demerits of using various taxonomic groups as indicators.

30hrs (T), 45hrs (P), C

BOT 418: Host-Pathogen Relations & Plant Disease Management

Credits

3

Host penetration and colonization. Pre- and post-penetration interactions of the host, pathogen and environment. Mechanisms of damage and resistance. Methods of disease control and management.

30hrs (T), 45hrs (P), C

BOT 419: Introduction to Mushroom Growing Technology

Credits

3

Biology, ecology and economic importance of mushrooms. Collection, identification and preservation of mushrooms. History of mushroom cultivation. Spawn production and cropping.

30hrs (T), 45hrs (P), C

UIL-BOT 403: Plant morphogenesis

Credits

3

Meaning of morphogenesis. Characteristics of morphogenesis. Stages of morphogenesis. Importance of morphogenesis. Morphogenesis in plants. Photomorphogenesis. Meristems and organization of the shoot and root apices. Pattern and control of cell and tissue differentiation. Development of vegetative organs. Plant tissue culture: techniques and applications. Significance of plant tissue culture. Meristem culture, organ culture and embryo culture. Methods of plant cell, tissue and organ cultures. Types of culture of plant materials (explant, callus, organ, embryo, cell and protoplast cultures). Growth media composition with emphasis on roles of plant hormones and vitamins. Ontogeny of floral organs. Abnormal morphogenesis. Application of plant tissue culture (improvement of hybridization, production of encapsulated seeds, production of disease and stress resistant plants, micropropagation and production of secondary metabolites)

30hrs (T), 45hrs (P), E

UIL-BOT 405: Plant Transformation Technology

Credits

3

The organization and expression of plant genes. DNA, chromatin and chromosome structure. Regulation of gene expression. Plant tissue culture. Plant growth regulators. Plant regeneration. Techniques for plant transformation. Agrobacterium mediated gene transfer. Direct gene transfer methods. Strategies for plant improvement (CRISPR etc.), selectable markers and markers for screening. Vectors for plant transformation. Tumour-inducing plasmids (Ti-plasmid). Improving quality characters in plants. Reducing

the effect of viral diseases. Molecular farming. Improvement of carbohydrates and lipids. Edible vaccines. Trends on national and global status

30hrs (T), 45hrs (P), E

UIL-BOT 412: Wood and its industrial utilization

Credits

3

Processes of wood formation. Wood anatomy and quality. Structure and composition of wood. Properties of wood. Wood modifications. Wood processing and wood conversion. Principles of pulp and paper making. Making of matches and matchstick. Engineered wood. Wood-based industry and interior designer. Conversion of wood into pulp and biorefinery products. Timber technology. Bamboo technology. Wood digitalization. Wood and the environment. Wood processing residues or wastes. Timber defects. Timber protection.

30hrs (T), 45hrs (P), E

UIL-BOT 418: Biomimetics

Credits

3

Meaning and differences between biomimetics, bionics and biomimicry. Types of biomimetics. Principles of biomimetics. Levels of biomimetics. Process of biomimetics. Tools of biomimetics. Practice of biomimetics. Functional morphology of plants. Biological structures and functions: vessels, fibres, trichomes etc. design of biomaterials. DNA, proteins, fats and carbohydrates. Structures and properties of bio-composites: wood, collagen, silk etc. Design and genesis of synthetic materials. Examples of biomimetics. Applications of biomimetics. Plants as model in biomimetics and biorobotics.

30hrs (T), 45hrs (P), E

UIL-BOT 422: Applied Ethnobotany

Credits

2

Introduction to ethnobotany. Culture and the uses of plants. Ethnobotany in Nigeria. Plant diversity and traditional botanical knowledge. Plants as a source of food. Commercial products derived from plants. The use of plants as textile dyes. The use of plants to access alternate psychological states and the role of plants in faith and belief. Plants and Human Health. Medicinal and poisonous plants. Modern medicines and herbs. Medicinal plants and human security. Medicinal plants as first aid. Conservation and perpetration of cultural plant knowledge. Preparation of condiments. Production of plant-based snacks. Production of skin care products from plants

15hrs (T) 45hrs (P) E

SUMMARY

100 Level

Compulsory Courses	BIO 101(2), BIO 102(2), BIO 107(1), BIO 108(1), BOT 102(2)	= 8 Units
Required Courses	CHM 101(2), CHM 102(2), CHM 107(1), CHM 108(1), COS 101(3), GST 111(2), GST 112(2), MTH 101(2), MTH 102(2), PHY 101(2), PHY 102(2), PHY 107(1), PHY 108(1), ZOO 102(2)	= 25 Units
Elective Courses	Nil	
Total Units (100L)		= 33 Units

200 Level

Compulsory Courses	BIO 201(2), BIO 202(2), BIO 203(2), BIO 204(2), BIO 205(2), BOT 202(2), BOT 203(2), BOT 299(3), UIL-BOT 204(2), UIL-BOT 205(2)	= 21 Units
Required Courses	BCH 202(2), CHM 211(2), CHM 212(2), CHM 213(2), ENT 211(2), GST 212(2), ZOO 211(2)	= 15 Units
Elective Courses	Nil	
Total Units (200L)		= 36 Units
Direct Entry (DE):	GNS 111(2), GNS 112(2)	= 4 Units
Total (200L DE)		= 40 Units

300 Level

Compulsory Courses:	BOT 301(3), BOT 302(3), BOT 303(3), BOT 304(3), BOT 305(3), BOT 306(3), BOT 311(3), BOT 312(3), BOT 399(3), UIL-BOT 308(2), UIL-BOT 310(2), UIL-BOT 313(2), UIL-BOT 314(3), UIL-BOT 315(2), UIL-BOT 317(2)	= 40 Units
Required Courses:	GST 312(2), ENT 312(2)	= 4 Units
Elective Courses:	UIL-BOT 318(2), UIL-BOT 319(2)	= 4 Units
Total Units (300L):		= 48 Units

400 Level

Compulsory Courses:	BOT 401(1), BOT 402(2), BOT 403(2), BOT 404(3), BOT 406(3), BOT 407(3), BOT 408(3), BOT 409(3), BOT 411(3), BOT 413(6), BOT 414(3), BOT 415(3), BOT 416(3), BOT 417(3), BOT 418(3), BOT 419(3)	= 47 Units
Required Courses:	Nil	
Elective Courses:	UIL-BOT 403(3), UIL-BOT 405(3), UIL-BOT 412(2),	

	UIL-BOT 418(2), UIL-BOT 422(2)	=12 Units
Total Units (400L):		= 59 Units

Graduation Requirements

UTME = 160 Units

DE = 131 Units

