

**1. SYNOPSIS OF COURSES TAUGHT IN THE DEPARTMENT OF BIOLOGICAL SCIENCES AND BIOTECHNOLOGY**

<b>BIOLOGY COURSES</b>		
<b>100 LEVEL</b>		
<b>BIO 101</b>	<b>Organism and Environment</b> -	<b>3 units</b>
	The basis of life. Characteristics of an organism, concept of taxonomy. Abiotic and Biotic component of the environment. Edaphic factors. Impact of man on the environment.	
<b>BIO 102</b>	<b>Principles of Biology</b> -	<b>3 Units</b>
	Macro-molecular basis of life. Cellular basis of Biological organization. Cell structure and function: Energy production and utilization; Genetic inheritance and variation; reproduction; and embryogenesis and growth	
<b>BIO 191</b>	<b>Practical Biology I</b>	
<b>BIO 192</b>	<b>Practical Biology II</b>	
<b>200 Level</b>		
<b>BIO 201</b>	<b>Introduction to Cell Biology and Genetics</b> -	<b>3 Units</b>
	Cell structure and function. Chromosome organization. Mendelian genetics. Linkage and recombination. Sex-linked inheritance. Polygenetic inheritance. DNA, RNA, Protein synthesis, Bioenergetic. Membrane Biology. Embryogenetic development and genetic manipulation.	
<b>BIO 202</b>	<b>Introductory Ecology</b> -	<b>3 Units</b>
	The ecosystem and community structure. Ecological factors affecting plants and animals in terrestrial and aquatic habitats. Major terrestrial biomes. Productivity, energy flow and nutrient cycling.	
<b>BIO 203</b>	<b>Biological Techniques I</b> -	<b>2 Units</b>
	Microscope and types. Preparation of microscopic slides, photometry, colorimetry, chromatography, conductometry, measurements and scales of drawing	
<b>BIO 204</b>	<b>Biological Techniques II</b> -	<b>2 Units</b>
<b>BIO 205</b>	<b>Introductory Biotechnology</b> -	<b>2 units</b>
	History of biotechnology. Traditional biotechnology. Modern biotechnology. Biotechnology as an interdisciplinary subject. Applications in health care, agriculture, environment, genomics, proteomics. Bioinformatics. Global impact of biotechnology.	
<b>300 LEVEL</b>		
<b>BIO 301</b>	<b>Genetic Variability and Evolution</b> -	<b>3 Units</b>
	Structure of DNA, Mutation, Protein synthesis. Effects of mutation as protein structure. Mechanism of Genetic recombination. Genetic mapping at the molecular level. Mendelian populations and Hardy-Weinberg equilibrium. Variation and natural selection and specimen. Evolution.	
<b>BIO 302</b>	<b>General Ecology</b> -	<b>3 Units</b>
	The Ecology of local terrestrial and aquatic communities. Production Ecology. Population characteristics and the regulation of number.	
<b>BIO 303</b>	<b>Field Course I</b> -	<b>2 Units</b>

	Sampling techniques in local habitats. Assessment by report writing.
<b>400 Level</b>	
<b>BIO 401</b>	<b>Genetics in Molecular Biology</b> - <b>4 Units</b> Genetic fine structure analysis in organism. Biochemical and nucleic acid genetics. Structure and function of DNA and RNA. Genetic recombination and replication. Semi-conservative replication of DNA Genetic control of protein biosynthesis. The evolution of genetic system.
<b>BIO 402</b>	<b>Biogeography</b> - <b>2 Units</b> Zoogeographic regions and transition zones. Continental drift and plant and animal distribution. The impact of man on the distribution of plants, animals and diseases. The origin of domesticated animals and cultivated crops.
<b>BIO 403</b>	<b>Impact of Biology on Society</b> - <b>2 Units</b> Concepts in Biology which has influenced human societies, evolution, genetics, biotechnology, global warming and environment
<b>BIO 404</b>	<b>Environmental Biology</b> The human Environment. Impact of man's activities on the environment. Pollution from domestic agricultural and industrial sources and their effects on land use, plants and animals. Management of Human environment including solid waste disposal. Environmental mutagens and carcinogens.
<b>BIO 405</b>	<b>Field Course II</b> - <b>2 Units</b> Sampling techniques. Sampling methods in Hydrobiology, Aquaculture, Entomology, Parasitology, environmental Biology, Cell Biology and Genetics
<b>BIO 413</b>	<b>Quantitative Biology</b> Quantitative characterization of population (mean, standard deviation, variance, coefficient of variation); sampling and sampling distributions (Z-, t-, F- and X distribution); Analysis of bi-variance data; principles of experimental designs, Application of computer programmes to data management (access and Excel), data entry and management, computing of descriptive statistics, graphics and applications, tools for data analysis (Excel, As, GZAT); P for analyses of variance and mean separation; Presentation. of data, tables graphs, histograms and charts.
<b>MICROBIOLOGY COURSES</b>	
<b>200 Level</b>	
<b>MIC 201</b>	<b>Introduction to Microbiology</b> - <b>3 Units</b> Historical developme2nts and scope of microbiology. Functional classification and morphology of micro-organisms, microbial nomenclature-fungi, algae, bacteria, viruses, protozoa, Rickettsia and Chlamydiae, Actinomycetes, Microbial physiology and biochemistry; reproduction, useful and harmful microorganisms.
<b>MIC 202</b>	<b>Basic Techniques in Microbiology</b> - <b>2 Units</b> Basic laboratory methods for the cultivation and isolation of micro-organisms including use of microscopy, culture media, staining methods, maintenance of cultures. Sterilization and disinfection. Microbial cultivation and enumeration. Identification of microorganisms.
<b>300 Level</b>	
<b>MIC 300</b>	<b>Industrial Training</b> - <b>4 Units</b>

	Student Industrial Training program outside the University. Assessment on visitations, and of log books, bound report and that of the industry based supervisor will be employed in evaluation. Student will be expected to present a seminar on the experience as part of the evaluation..
<b>MIC 301</b>	<b>Immunology and immunochemistry</b> - <b>3 Units</b> Basic concepts of the immune system. A brief historical review of immunology as a subject. Innate and specific acquired immunity. The antigens: nature and types. The antigenic determinant site. The immunoglobulin. Structure, classification, genetics and functions. The complement system. Antigen – antibody interactions: biochemical and immunochemical assays. Theories of antibody formation: cells and organs involved in the immune response. Synthesis of humeral antibody. Development of the immune response. Infection and immunity. Hypersensitivity. Fundamental immunologic phenomena – immunologic tolerance, autoimmunity, transplantation immunology. Prophylactic and the therapeutic application of immunology.
<b>MIC 305</b>	<b>Pharmaceutical Microbiology</b> - <b>3 Units</b> Concept of growth and death in microorganisms. The chemistry of synthetic chemotherapeutic agents and antibiotics. Production and synthesis of antibiotics and antiseptics. Relationship of antimicrobial agents to different microbial groups. The mode of action and assay of antibiotics and antiseptics. Sensitivity and resistance as related to microbial physiology. Microbiological quality control in the pharmaceutical industry. Industrial antibiotic production.
<b>MIC 304</b>	<b>Research Method</b> - <b>2 Units</b> Problem identification, definition and conceptualization. Experimental designs and analysis. The research process.
<b>MIC 307</b>	<b>Bacteriology</b> - <b>3 Units</b> A detailed coverage of classification and characteristics of bacteria – host parasite relationship. Pathogenic microorganisms and diseases. Virulence, spectrum and symptoms of infection, treatment and control, Koh's postulates. Methods of isolation of pathogens. Bacterial infections. Statistical application to epidemiology. Nature of epidemics. Epidemiological investigations. Spectrum of infection. Hard Immunity. Lateness of infections. Multifactorial systems in epidemics. Biological products of immunization. Recommended immunization schedules. International control of infectious diseases.
<b>MIC 308</b>	<b>Enzymology</b> - <b>3 Units</b> Classification and sources of enzymes. Enzyme production techniques and methods of enzyme purification. Enzyme biochemistry and industrial utilization. Enzyme kinetics.
<b>MIC 309</b>	<b>Agricultural and Soil Microbiology</b> - <b>3 Units</b> Soil type. Microbial ecology of the soil. Association among soil microorganism. Method of isolation of microorganisms from the soil. Utilization of soil microorganisms. Role of soil microorganisms in Agriculture and their applications. Microbial fertilizers.
<b>MIC 310</b>	<b>Scientific Writing and Presentation</b> - <b>2 Units</b>

	Scientific communication. Types of written and oral communication in science and therefore a Scientific writing and illustrations. Modern information technologies. Practical assignments of writing project proposals, oral presentations and poster presentation
<b>MIC 311</b>	<b>Introductory Virology - 3 Units</b> General introduction to viruses (structures). Replication/multiplication of viruses. Viruses and infection. Epidemiology and diagnosis. The DNA and RNA viruses (pathogenesis and mechanism of virus infection). Isolation and tropism of viruses. Tissue culture and virus propagation. The arboviruses and enteroviruses. The togaviruses and rhabdoviruses. Haemorrhagic fever viruses. Kyasanor forest disiasars and the retrividae HIV. The Auenaviridae and herpes viridae. Viral hepatitis and the influenza viruses. Hepatitis – B-viruses and the azidivridae. Yellow fever viruses and measles viruses. The picornaviruses and the phinoviruses. Viral Zoonoses. Vaccination and vaccine.
<b>400 Level</b>	
<b>MIC 401</b>	<b>Ecological Microbiology - 3 Units</b> The microbial environment. Concepts in environmental microbiology. Microbial population and community dynamics. Microorganisms in their natural environments. The terrestrial environment – the nature, chemical activities of soil microflora, nitrogen fixation. The aquatic environment – the microbiology of water supplies, water treatment, water supply and public health – sewage disposal in the hot climates. Biodegradation of materials. The role of microbes in prospecting recovery and degradation of petroleum products. Aerobiology, sources, importance and control of airborne microorganisms.
<b>MIC 402</b>	<b>Petroleum Microbiology - 3 Units</b> Pollution. Micro-organisms associated with petroleum – their physiology and enzymology, Beneficial application of microorganism in oil and gas exploration and cleaning. Developments in petroleum microbiology.
<b>MIC 403</b>	<b>Medical and Pathogenic Microbiology - 3 Units</b> The normal human flora. Principles of infection, immunity and serology. Host-parasite relations. Etiology, epidemiology and pathogenic mechanisms, clinical symptoms, laboratory diagnosis and procedures, prophylactic and therapeutic procedures, control and prevention of selected bacterial, protozoan and fungal disease of animals including man especially those prevalent in Africa. Fungi, bacteria viruses and nematodes as pathogens of crop plants. Selected crop diseases, assessment of disease severity and estimation of losses. Disease control measures including biological control of pests and pathogens.
<b>MIC 404</b>	<b>Medical Mycology - 3 Units</b> Spectrum of fungi and yeasts associated with human and animal diseases – ethiology, epidemiology, mechanisms and clinical symptoms. Laboratory isolation procedure and identifications. Controls.
<b>MIC 405</b>	<b>Virology Techniques and Tissue Culture - 3 Units</b> Laboratory techniques for the isolation, cultivation and maintenance of plant and animal virus in-vivo. Tissues culture and its applications in food

	production. Viruses as agents of diseases in animals.
<b>MIC 406</b>	<b>Fermentation Technology</b> - <b>3 Units</b> Basic operations in industrial fermentation. Bioreactors designs. Process controls an automation in bioreactors. Strain improvements of industrial microorganisms; Media for industrial fermentation. Pilot plants. Continuous and batch fermentation operations. Industrial production of ethanol, acetic acid, lactic acid, vitamins, amino acids etc.
<b>MIC 407</b>	<b>Microbiological Quality Control</b> - <b>3 Units</b> Concept of quality and quality control in industrial processes. Sampling . Hazard analysis, Critical control Point system. Microbiological quality control in the food industry, pharmaceutical industries and water processing factories.
<b>MIC 408</b>	<b>Brewing Technology</b> - <b>2 Units</b> Raw materials in brewing; Malting and mashing; Brew house equipment; Brewing yeasts; Beer fermentation and controls.
<b>MIC 409</b>	<b>Essay in Microbiology</b> - <b>3 Units</b> Written report of a detailed topic of microbiological and or biotechnological interests. Students will be encouraged to carry out on-line internet literature search for the exercise. Student will be expected to cover the current state of knowledge on the subject matter.
<b>MIC 410</b>	<b>Diary Science and Technology</b> - <b>2 Units</b> Milk as a raw material. Milk nutrition and composition. Milk secretion – factors affecting secretion. Milk extraction equipment. Milk borne pathogens. Milk processing and treatment – pasteurization, sterilization, concentration and homogenization. Fermented milk products – Yoghurt, None etc. – processing. Probiotic foods.
<b>MIC 412</b>	<b>Microbial Physiology and Metabolism</b> - <b>3 Units</b> Microbial growth. Nutrition and energy metabolism of microorganisms. Effect of physical and chemical factors on growth. Microbial transport regulation. Microbial biosynthesis and metabolism.
<b>MIC 413</b>	<b>Food Microbiology</b> Food and microorganisms; Classification and identification microorganisms important in food. Principles of food preservation. Use of high temperatures, radiation, pressure, food additives and drying. Microorganism as food. Microbial food production contamination, preservation and spoilage of different types of foods. Foods in relation to disease – food-borne infections and intoxications. Food borne disease outbreaks. Food sanitation control and inspection.
<b>MIC 498</b>	<b>Seminar</b> Seminar presentation on the literature survey carried out on the subject of Research project before the commencement of the project.
<b>MIC 499</b>	<b>Research Project</b> - <b>4 Units</b> A research project and dissertation to be undertaken on any topic of microbiological and or biotechnological interest.
<b>PLANT SCIENCE COURSES</b> <b>100 LEVEL</b>	
<b>PSB 101</b>	<b>Diversity of Plant Life</b> - <b>3 Units</b>

	To present an overview of the biodiversity of organisms that are traditionally included in the Plant Kingdom (algae, Fungi, Lichens, Mosses, Ferns, gymnosperms, angiosperms). Emphasis to be placed on relationship between form and functional adaptations in plants and how these have influenced their evolution in various ecosystems. Symbiosis and co-evolutionary relationships between and among plants and other groups of organisms.
<b>PSB 102</b>	<b>The Flowering Plant</b> - <b>2 Units</b> Seed germination, growth, pollination, fertilization and fruit/seed development; Adaptation of plants to various ecosystems; xerophytes, mesophytes and hydrophytes
<b>200 Level</b>	
<b>PSB 201</b>	<b>Plant Morphology</b> - <b>2 Units</b> External features of angiosperm, variations in the structure of roots, stems, leaves, inflorescences, flowers, fruits and seeds. Implications of these variations in plant systematics.
<b>PSB 202</b>	<b>Whole Plant Physiology</b> - <b>2 Units</b> Plant cells and water; water relation of the whole plant; evapotranspiration; mineral nutrition, member transport, ascent of sap, translocation, water stress effect.
<b>PSB 203</b>	<b>Introduction to Plant anatomy</b> - <b>2 Units</b> Development and organization of primary plant body, tissues and organs development; comparative anatomy of primary plant body
<b>PSB 204</b>	<b>Introduction to Ethnobotany</b> - <b>2 Units</b> Medical plants of people of West Africa, Ethno-veterinary medical plants, plants used for dyes, food colours, preservatives and pesticides, wild edible fruits and vegetables, aromatic plants, oil plants (vegetable and essential), wild silk plants, wild forage and fodder plants. Domestication of osme wild useful plant.
<b>300 Level</b>	
<b>PSB 301</b>	<b>Taxonomy of Angiosperms</b> - <b>4 Units</b> Origin of angiosperms, Principles of plant taxomony, Taxonomic methods, Nomenclature, Identification and classification, Construction and use of taxonomy and chemotaxonomy, Herbarium methods and organization.
<b>PSB 303</b>	<b>Physiological Plant Ecology</b> - <b>3 Units</b> Plants and Environment with particular emphasis on the local factors which limit plant growth, reproduction, and diversity. Energy flow and nutrient cycling. Mechanism by which plant interacts with their local environment and effects of these interactions of diversity and community functioning; Estimation of importance – density, frequency cover and yield. Sampli9ng techniqu2es, Interaction among organisms
<b>PSB 305</b>	<b>Plant Breeding</b> Objectives of plant breeding; origin and domestication of basis of breeding, self and cross pollinated crops. Breeding methods, pure lines breeding and mass selection, pedigree method; bulk population breeding, back crossing breeding; recurrent selection, heterosis, chromosome manipulation.
<b>PSB 307</b>	<b>Introduction to Horticulture</b>

	Diseases, their causes and symptoms. Life history of typical plant parasitic infection. Principles of disease control. Fungal, bacterial and viral diseases. Basic classification of tropical crops, Propagation by seed Vegetative Propagation Anatomical basis of vegetative propagation. Tissue culture. Divisions of horticulture. Land preparation and field layout for plantation crops. Botany, origin, distribution and cultivation of selected tropical vegetable and tree crops.
<b>PSB 309</b>	<b>Plant Biotechnology</b> - <b>3 Units</b> Using examples from current research, techniques used in modern plant biotechnology and the way this technology is being used to modify and improve economically important plants will be discussed. Specific topics will include; gene isolation, plant transformation, plant tissue culture, clonal plant propagation, and some embryogenesis.
<b>PSB 311</b>	<b>Mycology</b> - <b>3 Units</b> Structure, life cycle and classification of true fungi. Presence and role of Fungi in Agriculture and food industry, Mycotic infections and its importance of Fungi.
<b>PSB 313</b>	<b>Plant Metabolism</b> Enzymes; Plant specific metabolic processes and their regulation; molecular biology, structural and storage carbohydrates, lipid metabolism; nitrogen fixation and assimilation, photosynthetic processes and secondary plant metabolites and the ecological function.
<b>400 Level</b>	
<b>PSB 401</b>	<b>Advance Plant Anatomy</b> - <b>3 Units</b> Secondary meristem. Development of secondary plant body, Wood structure and identification, floral anatomy; embryogenesis, Fruit structure
<b>PSB 402</b>	<b>Advanced Ethnobotany</b> - <b>3 Units</b> Survey of historical and current use of important drug-producing plants. Evaluation of the chemistry and physiology of biologically active compounds from poisonous analgesic, and hallucinogenic plants, and the current uses of such plant products. Use of plant biotechnology to develop drug producing plants.
<b>PSB 403</b>	<b>Weed Biology and Control</b> - <b>3 Units</b> Identification and classification of weeds mechanisms of survival in annual and perennial weeds, interaction and competition between crops and weeds, preventive aspects of weed ecology and control weed.
<b>PSB 404</b>	<b>Physiology of Plant Growth and Yield</b> - <b>4 Units</b> Water. Light, temperature and gases as factors of the environment; Growth phases and rhythms, assimilate partitioning in relation to yield, determination and patterns; crop geometry and cultural manipulation, implication in plant yield; storage physiology of plant products.
<b>PSB 405</b>	<b>Molecular approaches to Plant Systematics</b> - <b>3 Units</b> Basic of molecular and evolutionary genetics; serology, amino acid sequencing and DNA: DNA hybridization; Isozymes and allozymes; Cloning; Population genetics and conservation; speciation and hybridization; Molecular cytogenetics.

<b>PSB 406</b>	<b>Plant Diseases Development, Epidemiology and Control - 4 Units</b> The development and spread of plant diseases, host-pathogen and environmental relationships and disease physiology; diseases of selected tropical crops; principles and methods of disease control and management, disease resistance and immunity.
<b>PSB 407</b>	<b>Plant Molecular Physiology - 3 Units</b> Molecular and cellular biology of plants, with emphasis on signaling and regulation of gene expression mediating physiological responses of plant cells. Topics covered include molecular responses to light, nutrients, and environmental cues, action of plant growth regulators and regulation of metabolism
<b>PSB 408</b>	<b>Floriculture and Landscape Planning - 3 Units</b> Identification, culture and uses of important ornamental plants, flowering shrubs, climbers and avenues plants. Lawn and grasses, Nursery Management. Principles of landscape planning and design. Estate and recreational landscapes.
<b>PSB 409</b>	<b>Soil Ecology</b> Classification and characteristics of soils, chemical components and analyses of soil and plant tissues. Cycling of mineral pools. Plant-soil water relations. Soil organic matter and soil organisms.
<b>PSB 410</b>	<b>Vegetation Ecology - 3 Units</b> Ecosystem and community structure. Chemical interaction. Succession. Pattern of spatial distribution of plants. Vegetation profile mapping. Quantitative assessment of vegetation structure. Nigerian vegetation. Deforestation, overgrazing, over-cultivation, invasion as factors of biodiversity erosion.
<b>PSB 413</b>	<b>Systematics of Non –Flowering Plant - 3 Units</b> Blue green and Green Algae, Bryophytes and Pteridophytes – their classification, ecology, reproduction and economic importance. Lower plants as bioindicators of air pollution.
<b>PSB 498</b>	<b>Topics in Plant science and Biotechnology - 2 Units</b> A topic to be selected for detailed study based literature search in libraries and on the internet or report of industrial attachment.
<b>PSB 499</b>	<b>Projects In Plant science and Biotechnology - 4 Units</b> Directed experimental studies in specialized field of Plant Physiology, Ecology, Toxicology, Weed Control, Phytopathology, Genetics, Plant Breeding, Horticulture, Ethnobotany, Industrial Uses of Plants with emphasis on problems of Agricultural/Industrial important
<b>ZOOLOGY COURSES</b> <b>100 LEVEL</b>	
<b>ZAQ 101</b>	<b>Diversity of Animal Life - 3 Units</b> General classification of animals. Characteristic and life history of representative types of each phylum. Animal of veterinary and agricultural importance.
<b>ZAQ 102</b>	<b>The Mammalian Body</b> The anatomy, physiology and adaptation to the environment of a names



	mammal. External features; skeletal and muscular systems; digestion and absorption of food; Respiration and transport, the blood and circulatory system. The Kidney and homeostasis. Nervous and chemical coordination.
<b>200 Level</b>	
<b>ZAQ 201</b>	<b>Invertebrate Zoology</b> The systematic, inter-relationships and basic organization of the invertebrates
<b>ZAQ 202</b>	<b>Chordate Zoology</b> The systematic, inter-relationships and basic organization of the chordates, particularly, the vertebrates
<b>300 Level</b>	
<b>ZAQ 301</b>	<b>Proto-zoology</b> - <b>3 Units</b> Classification of the Protozoa. Morphology, anatomy and life cycles of the various groups of the Protozoan, with emphasis on those of medical and veterinary importance. Control strategies for the parasites. Concepts of vaccine development for the control
<b>ZAQ 303</b>	<b>Arthropod Diversity</b> - <b>4 Units</b> Classification of the Arthropods. Adaptive radiation within the phylum Arthropoda, with particular reference to structures and functions of the body appendages. General Biology of selected Arthropod groups. Biological success of the Arthropods.
<b>ZAQ 305</b>	<b>Animal Development</b> - <b>3 Units</b> Processes of development. Gene activity in oogenesis. Cytoplasmic localization in the mature egg. The sperm. Fertilization, Cleavage. Gastrulations and cell interaction. Cellular and molecular basis of embryogenesis. Tissue interaction in development. The significance of the placenta and the development of natural immunity.
<b>ZAQ 307</b>	<b>Introduction to Aquaculture</b> - <b>4 Units</b> History, present status of aquaculture in Nigeria. Site selection, fish farm design and construction. Selection of culture species. Pond liming fertilization, stocking, feeding, general culture system management and harvesting. Economic consideration of aquaculture. Principles of aquaculture.
<b>ZAQ 311</b>	<b>Helminthology</b> - <b>3 Units</b> Classification, adaptation, morphology, anatomy and life cycle and other features of interest in the Platyhelminthes, Nematodes and parasitic Arthropods. Epidemiology and control. Role of vectors in the transmission of diseases
<b>ZAQ 312</b>	<b>Special topics in zoology and aquaculture (term paper)</b>
<b>ZAQ 313</b>	<b>Histotology</b> The cellular basis of tissue formation. Stability of the differentiated state. The formation, distribution, structures and functions of the vertebrate tissue. The organization of tissues into organ systems.
<b>ZAQ 315</b>	<b>Vertebrate Zoology</b> Vertebrate systematic, evolution and functional anatomy. Geographical distribution of recent vertebrates. The Nigerian vertebrate fauna, with emphasis on fishes and mammals.

<b>ZAQ 317</b>	<b>Animal Biotechnology</b>
<b>ZAQ 318</b>	<b>Industrial Training</b>
<b>ZAQ 391</b>	<b>Zoological Techniques I</b>
<b>ZAQ 398</b>	<b>Essay</b>
<b>400 Level</b>	
<b>ZAQ 401</b>	<b>Hydrobiology</b> Physico-Chemical and biological properties of fresh waters. Hydrology and Water Cycle. Cycle of life in marine brackish and fresh water. Phytoplankton and zooplanktons, their roles in freshwater productivity.
<b>ZAQ 402</b>	<b>Integrated Pest Management - 3 Units</b> Principles of integrated pest managements. Traditional chemical pest control. The role of plant breeding and natural enemies on ecological management of pests. Specific examples of successful biological control strategies in Nigeria
<b>ZAQ 403</b>	<b>Fisheries Biology and Nutrition - 3 Units</b> Forms and Functions of each system of organs of fish. Embryology and Life history of fish of commercial value – catfish, tilapia and prawn. Nutrient requirement of fish. Chemistry and nutritive value of various classes of fish feeds. Fish feed formulation. Principles of fish nutrition.
<b>ZAQ 404</b>	<b>Fish Culture system Design and Management - 4 Units</b> Classification of the different fish culture systems. Basic concepts of their design and construction. Their uses in different aspects of fish production; broodstock development, hatchery operations grow-out phase. Ornamental fisheries aquaria designs. Economics of large scale production industry. Record keeping.
<b>ZAQ 405</b>	<b>Wildlife and Conservation - 2 Units</b> Techniques of wildlife investigation. Principles of wildlife management. The wildlife resources, differences in values management, philosophies and traditions. CITE.
<b>ZAQ 406</b>	<b>Fish Processing and Marketing - 2 Units</b> Organoleptic assessment of fish quality. Principles and methods of fish preservation, storage and processing. Product development, evaluation and quality control. Traditional and Modern fish processing methods. Fish distribution and marketing in Nigeria.
<b>ZAQ 407</b>	<b>Fishing Gear Technology - 2 Units</b> Study of types of fishing crafts and gears. Classification of fishing gears and crafts selectivity. Properties of material s used in fishing gear construction. Design and construction of different types of gears and crafts. Assessment of fishing gear efficiency.
<b>ZAQ 408</b>	<b>Animal Products - 2 Units</b> Exploitation of animal products for human use. Aesthetic products. Honey production. Leather production, museum products and Ethno-zoology.
<b>ZAQ 409</b>	<b>Fishing Economics - 2 Units</b> Evaluation of fish and fisheries products demand and supply. Factors of production in fisheries activities: production, marketing, distribution and utilization. Economic evaluation of viability of artisanal and commercial culture and capture fisheries. Effect of government fiscal policy.

<b>ZAQ 410</b>	<b>Topics in Physiology</b> Special topics in Animal Physiology.	-	<b>2 Units</b>
<b>ZAQ 498</b>	<b>Essay</b> An essay based on a review of the literature on a Zoology or Aquaculture topic. A presentation of the essay in a seminar format.	-	<b>2 Units</b>
<b>ZAQ 499</b>	<b>Project</b> A research project involving an investigation in Zoology or Aquaculture, and a written presentation with discussion of results.	-	<b>4 Units</b>