

FEDERAL UNIVERSITY OF TECHNOLOGY, OWERRI

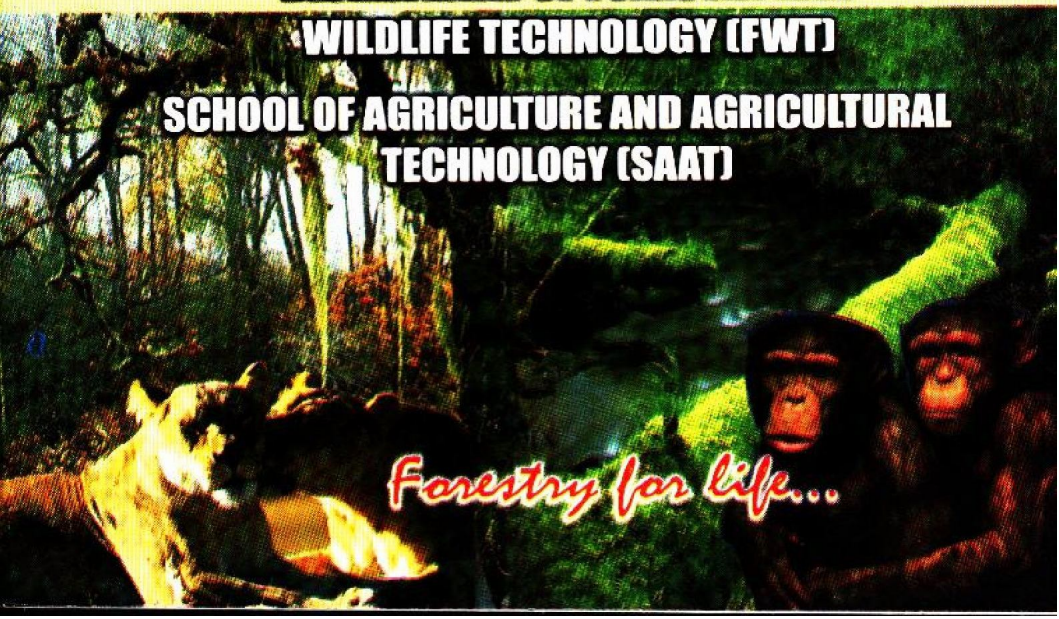
**P. M. B. 1526, OWERRI,
IMO STATE, NIGERIA.**



STUDENT'S HANDBOOK

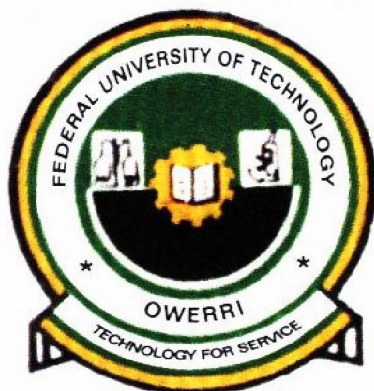
**OF THE
DEPARTMENT OF FORESTRY AND
WILDLIFE TECHNOLOGY (FWT)**

**SCHOOL OF AGRICULTURE AND AGRICULTURAL
TECHNOLOGY (SAAT)**



Forestry for life...

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P. M. B. 1526, OWERRI,
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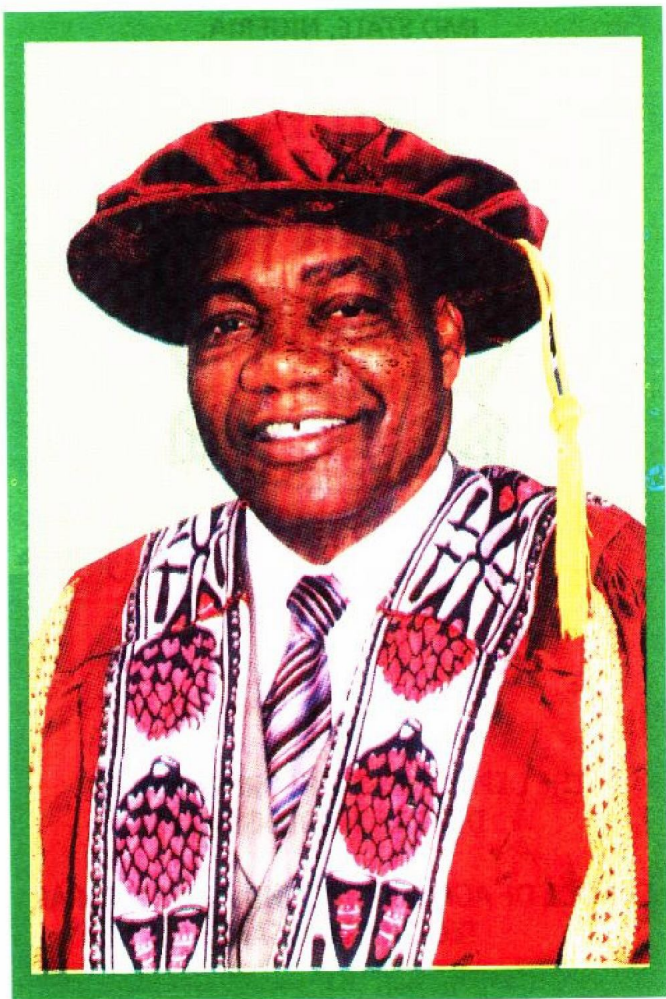
STUDENT'S HANDBOOK

OF
THE DEPARTMENT OF FORESTRY AND
WILDLIFE TECHNOLOGY (FWT)
SCHOOL OF AGRICULTURE AND AGRICULTURAL
TECHNOLOGY (SAAT)

Forestry for Life.....

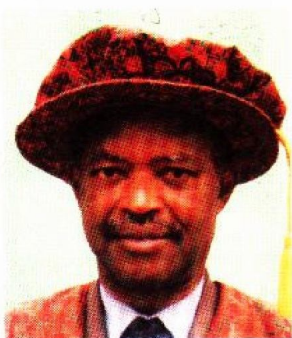


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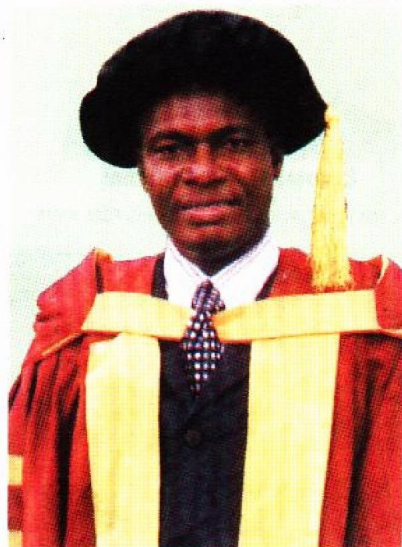


Ezinne Prof. (Noble Lady) V.A Onwulliri

JP, LKSJ, ALONA

DIRECTOR

Women/Child Research and Development Centre,
and wife of the Vice-Chancellor, FUTD



Dr. A.E. Ibe

Pioneer HOD,
Forestry and Wild-life Technology (FWT)

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FOREWORD

Forest resources are important for the economic well being of every nation. Although the size and quality of forest resources in most countries of the world have been reduced, their potential is now being recognized. Forest and agriculture are closely interrelated and often, competition occurs between them for land, labour and capital inputs. Sometimes, land used for supporting forest is converted to agricultural use as the need arises. In many parts of the world, especially where the climate is extreme, agricultural productivity is maintained and increased by the protective cover yielded by tree vegetation. Agricultural expansion provides markets for various forest products and thus encourages the economic management of forest resources.

Forests constitute both a sink and source of atmospheric Carbon dioxide CO_2 . Forest absorbs Carbon through photosynthesis but emits Carbon through decomposition and when trees are burnt due to anthropogenic and natural causes. Managing forests in order to retain and increase their stored Carbon will help to reduce the rate of increase in atmospheric CO_2 and stabilize atmospheric concentrations. Even though some degraded lands are unsuitable for forestry, there is considerable potential for mitigation through improved management of forestland for Carbon conservation, storage and substitution in balance with other objectives. Forest management practices that can restrain the rate of increase in atmospheric CO_2 can be grouped into three categories:

- i) Management for Carbon conservation
- ii) Management for Carbon sequestration and storage
- iii) Management for Carbon substitution

Conservation practices include options such as controlling deforestation, protecting forests in reserve, changing harvesting regimes and controlling other anthropogenic disturbances such as fire and pest outbreaks. Sequestration and storage practices include expanding forest ecosystems by increasing the area and or biomass and soil Carbon

density of natural and plantation forest and increasing storage in durable wood products.

Substitution practices aim at increasing the transfer of forest biomass Carbon into products rather than using fossil fuel based energy and products, cement based products and other non-wood building materials. However, the potential land areas available for the implementation of forest management options for carbon conservation and sequestration is a function of the technical suitability of the land grow tree and the actual availability as constrained by socio-economic circumstances.

For sustainable forest development, forestation is the way out. Forestation means increasing the amount of Carbon stored in vegetation (living above and below ground) dead organic matter and medium and long-term wood products. This process consists of reforestation, which means replanting trees in areas that were recently deforested [less than 50 years] and afforestation, the planting of trees on areas which have been without forest cover for a long time [for over 50 years].

To be more entrenched and sustained, there must be measures on forestation and agro-forestry involving government investment programmes targeted towards these practices on government owned land. Furthermore, community forestry programmes that may be supported by government by extension services must be encouraged to help enforce government policies. Also, private plantations with financial and other incentives provided by the government must be encouraged.

Professor Celestine O.E. Onwuliri, FAS, KSJ, JP

Vice-Chancellor

Federal University of Technology, Owerri.

PREFACE

The Department of Forestry and Wildlife Technology is one of the departments in the School of Agriculture and Agricultural Technology (SAAT) of Federal University of Technology, Owerri. It offers programmes leading to the award of Bachelor of Agric. Technology (B. Agric.Tech.) Degrees in Forestry and Wildlife Technology.

This Handbook contains information on various courses offered at different levels (years) and existing regulations governing student's academic programmes.

Students are expected to acquaint themselves with all the information contained in this handbook. Teaching Staff are also guided by this handbook on the course contents and the scope of options available.

All students are also advised to go through the current edition of the Undergraduates Academic Regulations of Federal University of Technology, Owerri for adequate information update.

DR. A. E. IBE

Head of Department

Forestry and Wildlife Technology

November, 2010

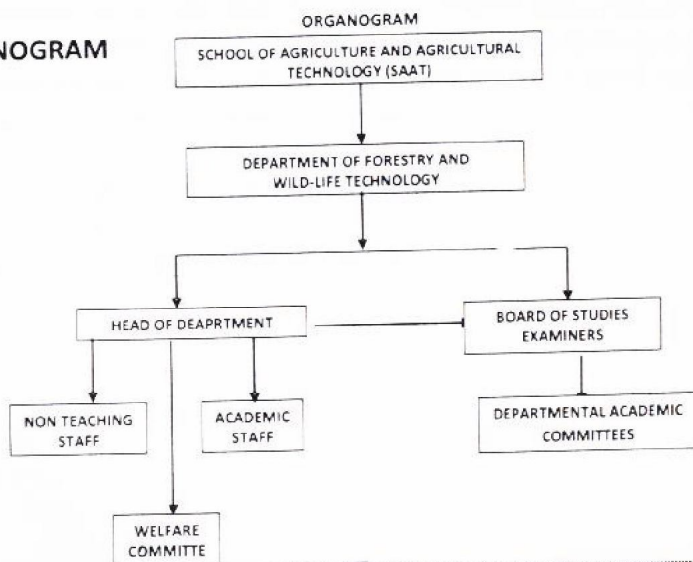
1.1.0 HISTORY OF THE DEPARTMENT

The Department of Forestry and Wildlife Technology though contained in the original FUTO master plan, only commenced in 2007. The take off of this Department was delayed due to logistic problems and administrative oversight; otherwise the take off date was scheduled for 1988 alongside other sister Departments now in the School of Agriculture and Agricultural Technology. At take off, a total of forty students were enlisted for the 5 years programme leading to the award of Bachelor of Forestry and wildlife Technology.

1.2.0 ORGANIZATION

The organization of Forestry and Wildlife Technology is a highly specialized area. A Head of Department, who provides academic and administrative leadership, administers it through committees system. The committees include; Departmental Board of Studies chaired by the HOD, Examination Committee, SIWES Committee and Appraisal Committee etc. The Head of Department usually conveys the departmental decisions to the School Board of Studies. The line of authority descends from the office of the Vice Chancellor as Chairman of Senate through the Dean of School to the Head of Department.

ORGANOGRAM



1.3.0 PHILOSOPHY

The Department of Forestry and Wildlife Technology (FWT) aims not only at imparting the theoretical knowledge but also at giving greater emphasis to practical experience in the field and the development of appropriate skills to the students through intensified practical works. The courses are designed to lay more emphasis on "do-it-yourself" exercises backed up with sufficient training and staff supervision. The courses taught in field schools every semester from the 1st to the 5th year involve practical application and theoretical subjects relevant to the Nigerian environment especially South-East zone. As technology must serve social needs and must understand the society in which they operate, students will be exposed to the humanizing and liberalizing influences of the social sciences. This will be achieved through some General Studies courses in School of Management Technology (SMAT).

1.4.0 AIMS/ OBJECTIVES

The aims/objectives are:

- a. To produce graduates geared towards self-employment.
- b. To produce graduates with scientific knowledge and skills necessary for the industry and any aspect of forestry and wildlife.
- c. To produce graduates that are relevant to the society and who can contribute effectively to wildlife management and conservation, produce raw materials for small, medium and large-scale industries, environmental conservation and enhance socio-economic development.
- d. To produce the required manpower which will not only be used in staffing Forestry and Wildlife establishments nationally but which also would be able to carry out relevant mission oriented researches into all aspects of Forestry and Wildlife, yet unexplored benefits and products which can serve as bases for newer industries.

1.5.0 CAREER OPPORTUNITIES

The course offers the following career opportunities.

1. RESEARCH SCIENTIST

There are about 21 national and international agro based Research institutes in the country working on various mandate as in tree crops such as Oil Palm, Cocoa, Cereals, Roots and tubers etc.

There are often opportunities for in-service training in most of the research institutes e.g. Forestry Research Institute of Nigeria Forestry Training.

2. CAREER IN AGRO-BASED INDUSTRIES

These includes paper mills, logging, packaging, saw mills, wood industries, commercial nurseries, landscape, parks/ gardens, etc

3. CAREER IN BANKS

The Central Bank and most commercial banks have agricultural departments, which normally finance agric projects. The graduate is employed as field operations officer. It is wrong to assume that only graduates of Agricultural Economics can work in banks. The graduates may work in the Nigeria Agricultural and Co-operative banks [NACB] as operations officer. This bank finances the major agricultural projects in the country and has branches in all the states of the federation.

4. CAREER IN AGRIC DEPT. OF OIL COMPANIES

Some oil companies such as Shell, Agip, Ashaland, Mobil etc. have agricultural departments usually forestry and plantation crop. It is through these departments that they assist the farmers in their areas of operation to improve their agricultural production as part of compensation to the community.

5. CAREER AS A UNIVERSITY LECTURER

A graduate of Forestry and Wildlife Technology may be employed as graduate assistant in any University offering Agricultural Science. Such a graduate may proceed to post graduate studies in any University specialization in any of the following disciplines: Plant breeding, Agro forestry crop physiology, weed science,

wood science, entomology, forest biometrics, plant pathology, agroclimatology, silviculture, ethnobotany, forest resources economics and management etc.

6. ENVIRONMENTAL HEALTH

The health sector at the primary, secondary and tertiary levels of health care delivery has different units of which environmental health unit is one. Environment comprises biotic and abiotic components of which how vegetation, wildlife and surrounding natural resources influence the health, comfort survival and livelihood of the people are of emerging health concern. Taught courses in the curriculum of the Department of Forestry and Wildlife Technology offer graduates needed leverage in taking up careers/employment in the environmental health units/department at varying levels/cadres of the national life.

7. CAREER IN CIVIL SERVICE AS FOREST OFFICER

The graduate may work in the Federal or State Ministry of Agriculture and also in states' Agricultural Development Programmes [ADP's]. The ADP's are supposed to be World Bank assisted.

8. CAREER AS TEACHER IN SECONDARY AND TERTIARY INSTITUTIONS

The graduate may teach Agricultural Science in a secondary or tertiary institution e.g. Colleges of Agriculture.

9. SELF EMPLOYMENT

The training programme in the Department is designed to equip the graduates technologically to go into private farming. The farm practice courses coupled with the 4th year SIWES should acquaint the graduate with the aspects of forest production from land preparation through field maintenance to harvesting, processing and storage. The banks and national directorates of employment have been of immense help to people who want to get into

private nurseries. In a country like ours, where mass graduate unemployment exists, a graduate of the department of Forestry and Wildlife should adjust faster in self-employment than graduates in other disciplines. Our products have creditably accessed these facilities to become successful job creators.

2.0 UNDERGRADUATES ACADEMIC PROGRAMME

Admission into the department is subject to the following requirements;

2.1 UTME Examination

- i. Candidates with credit passes at SSCE/WAEC/NABTEB/GCE 'O' Level in five subjects including the following at not more than two settings: Biology/Agricultural Science, Chemistry, Mathematics/Physics and either Geography, Economics with a credit pass in English Language.
- ii. Subjects to be offered at the University Tertiary Matriculation Examination (UTME) should include English Language, Biology/Agricultural Science, Chemistry and any other Science subject preferably Physics or Mathematics.

2.2 DIRECT ENTRY REQUIREMENT

FUTO Diploma holders as well as diploma holders from other recognized institutions can apply for direct entry admission provided they possess at least an upper credit level pass.

3.0 RULES AND REGULATIONS GOVERNING SESSIONAL EXAMINATIONS

In order to be admitted to any examination, a student must have registered for the course to be examined and must have fulfilled all university requirements concerning residence, fees and other matters.

The student must have fulfilled all university requirements regarding attendance and satisfactory completion of course-work, practical, projects and other assignments.

All students shall have the responsibility to be present for the examination in each course for which they registered.

It is the duty of the student to know the date, time and place of each examination.

Any student that does not meet the requirements specified above shall not be allowed to take the examination.

3.0 EXAMINATION OFFENCES

The following constitute examination offences;

3.1 CHEATING IN THE EXAMINATION

If any candidate is caught or suspected of cheating, receiving assistance or assisting other candidates or infringing on any other examination regulations, a written report of the circumstances shall be submitted by the Chief Invigilator to the Dean of the School offering the course within 24 hours after the examination session. The candidate concerned shall be allowed to continue with the examination, unless he or she behaves in such a manner as to disturb other candidates.

3.2 Any candidate suspected under the regulation above, shall be required to submit a written report (immediately after the paper) to the Chief Invigilator. Failure to make such a report shall be regarded as a breach of discipline.

3.3 The Dean shall send the report to the School Board of Studies. The School Board of Studies shall investigate the alleged offence and report to the Senate at the time the examination result of such a candidate is being considered. The Senate shall also determine the appropriate penalty for each offence.

3.4 Any candidate found guilty of the offences above, shall on the approval of Senate be.

- i. Expelled from the University
- ii. Handed over to the Police for persecution under the appropriate laws and degrees.

3.5 EXPULSION FROM THE UNIVERSITY

Student who has been found involved in cases of gross misconduct such as (but limited to) examination malpractice, convicted felony or other cases of criminal offences, association with or membership of secret cults or organization prescribed by the University or the Government, shall on the approval of Senate and without prejudice to section 16 of the Federal University of Technology, Owerri Law, be

- i. Expelled from the University
- ii. Handed over to the police for prosecution under the appropriate laws/decrees.

4.0 PROBATION AND WITHDRAWAL

Refer to Section 5 of the Handbook on Academic Regulations, 1991 -96, which states as follows:

4.1 SECTION FIVE (5): WITHDRAWAL FROM THE UNIVERSITY

4.2 Voluntary Withdrawal:

- (i.) Students who wish to withdraw from the University are required to notify the Registrar in writing as well as Dean of the School through the Head of Department. The period of withdrawal shall not exceed on academic year and subject to approval by Senate.
- (ii.) For returning students a written notice of withdrawal shall be given not later than four weeks after the beginning of the semester. For fresh students notice shall be given not later than two weeks after matriculation.
- (iii.) Any student withdrawal of the reason and the effective date of leaving.
- (iv.) In the case of such voluntary withdrawal, the refund of fees paid in excess of the period stayed in the University will be made by the Bursar's Office.
- (v.) Such a student may retain grades made for semester examinations (in semester courses taken prior to the date of withdrawal).
- (vi.) Students who so withdraw from the University shall, in order to be re-admitted send a formal application to and received official clearance from the Registrar.

- (vii.) Senate may prescribe conditions, which shall be fulfilled before students may resume their programmes of studies.

4.3 Unauthorized Withdrawal

Students who withdraw from the University without authority may not be considered for re-admission until their cases have been dealt with on their individual merits by Senate.

4.4 Withdrawal for Academic Reasons:

All students who are admitted into the University are expected to maintain acceptable standards of academic performance. Every student is also expected to maintain a minimum Grade Point Average for his/her year of study. Specially, students obtaining a Cumulative Grade Point Average of less than 1.00 shall be asked to withdraw from the University.

4.5 Withdrawal on Health Reasons:

A student may withdraw or be asked to withdraw for health reasons certified by the Director of Health Services of the University. Such a student shall be re-admitted into the University on production of a valid medical report from an approved Medical Office, and certified by the Director of Health Services.

4.6 Disciplinary Withdrawal:

Students who are suspended on grounds of disciplinary action may not be re-admitted unless with the express permission of the Vice-Chancellor.

5.0 AWARD OF DEGREE/DIPLOMAS

- 5.1 Degrees/Diplomas of the Federal University of Technology, Owerri shall be awarded to candidates who by the authority of the Senate, have been found worthy in character and in learning for the award of such degrees/diploma.
- 5.2 To be found worthy in learning, a candidate must have successfully completed and passed all the prescribed examinations and courses

of instruction required for such degree/diploma, within the stipulated time, or as the Senate may otherwise prescribe.

- 5.3 Student who have been found involved in cases of gross misconduct such as (but limited to) examination malpractice, convicted felony or other cases of criminal offences, association with or membership of secret cults or organization proscribed by the University or the Government, shall by the authority of the Senate, not be worthy in character for the award of a degree/diploma of the Federal University of Technology, Owerri.

6.0 REVIEW OF ACADEMIC REGULATIONS

Senate reserves the right to review the provisions of the Academic Regulation from time to time.

7.0 COURSE CURRICULA FOR B. AGRIC. TECH. (FORESTRY AND WILDLIFE TECHNOLOGY) COMMON COURSES FOR ALL STUDENTS

100 LEVEL

HARMATTAN SEMESTER

		Contact Hours			
		L	T	P	U
PHY 101	General Physics I	2	1	1	4
CHM 101	General Chemistry I	2	1	1	4
MTH 101	Elementary Mathematics I	3	1	0	4
BIO 101	Biology for Agric. Bio. Sci. I	2	0	1	3
GST 101	Use of English	1	1	0	2
ENG 101	Workshop Practice I	0	0	1	1
ENG 103	Engineering Drawing I	0	0	1	1
GST 103	Humanities, Philosophy & Logic	1	0	0	1
		20			

RAIN SEMESTER

		Contact Hours			
		L	T	P	U
PHY 102	General Physics II	2	1	1	4
CHM 102	General Chemistry II	2	1	1	4
MTH 102	Elementary Mathematics II	3	1	0	4
BIO 104	Biology for Agric. Bio. Sci. II	1	0	1	2
ENG 102	Workshop Practice II	1	0	1	2

GST 102	Use of English II	1	1	0	2
GST 108	Social Science I	1	1	0	2
GST 110	Science Tech. & Society	1	0	0	1
					20

200 LEVEL

HARMATTAN SEMESTER

		Contact Hours			
		L	T	P	U
CSC 201	Computer Applications	2	1	1	4
MTH 211	Statistics	2	1	0	3
AST 201	Principles of Animal Production I	1	0	1	2
AGR 203	Introduction to Agric.	1	0	1	2
AGR 205	Agricultural Chemistry	1	0	1	2
AEX 201	Agric. Ext. & Rural Sociology	2	0	0	2
AGR 207	Agricultural Biotechnology	1	0	1	2
AGR 209	Agric. Entrepreneurial Studies	2	0	0	2
GST 201	Nigerian & African Cultures	1	0	0	1
					20

RAIN SEMESTER

		Contact Hours			
		L	T	P	U
CST 204	Field Crop Production	2	0	1	3
FWT 202	Principles of Forestry Resources & Wildlife Management	1	0	1	2
AEC 202	Principles of Micro & Macro-Econ.	1	1	0	2
SST 202	Principles of Tropical Soils	1	0	1	2
CST 206	Agro-climatology & Biogeography	1	0	1	2
AST 202	Principle of Animal Production II	1	0	1	2
FAT 202	Principles of Fisheries & Aqua.	1	0	1	2
AGR 204	Agricultural Biochemistry	1	0	1	2
AGR 202	Farm Practice I	0	0	1	1

LONG VACATION

SIWES 200	Industrial Attachment	2
		20

300 LEVEL**HARMATTAN SEMESTER**

		Contact Hours			
		L	T	P	U
AST 301	Intro. To Tropical Animal Health	2	1	0	3
AGR 303	Agricultural Genetics	2	0	1	3
AGE 301	Farm Planning & Structure	1	0	1	2
FWT 303	Resource Inventory & Mensuration	2	0	0	2
FWT 309	Environmental Degradation & Reclamation.	2	0	0	2
FWT 305	Forestry Ecology	2	0	0	2
FWT 307	Wood Biology	2	0	0	2
FWT 311	Wildlife Taxonomy & Biology	2	0	0	2
AGR 301	Farm Practice II	0	0	1	1
FWT 301	Introduction to Silviculture	1	0	0	1
					20

RAIN SEMESTER

		Contact Hours			
		L	T	P	U
AGR 306	Processing & Storage of Agric. Food Products	2	0	1	3
AGE 302	Agric. Machinery & Mechanization	2	0	1	3
AGR 304	Agric. Statistics & Biometry	3	0	0	3
FWT 302	Forest Engineering	1	0	1	2
FWT 304	Forest & Land Survey	1	0	1	2
FWT 306	Forest Operation I	1	0	1	2
FWT 308	Natural Ecosystems	2	0	0	2
FWT 312	Principles of Wildlife Nutrition & Management	1	0	1	2
AGR 302	Farm Practice III	0	0	1	1
					20

400 LEVEL**HARMATTAN SEMESTER**

		Contact Hours			
		L	T	P	U
FWT 413	Wood Processing, Preservation & Utilization.	1	0	1	2

FWT 401	Introduction to Land Use Planning	1	0	0	1
MGT 405	Technical Report Writing	2	0	0	2
FWT 403	Agro-Forestry Technology	1	0	1	2
FWT 405	Ground/Aerial Survey				
	Photogrammetry	1	0	1	2
FWT 417	Urban Forestry	1	1	0	2
FWT 407	Zoo & Park Management Tech.	1	0	1	2
FWT 409	Museum & Herbarium Technology	1	0	1	2
FWT 411	Forestry/Wildlife Ecological Survey	1	0	1	2
FWT 415	Forest Operation II	0	0	2	2
AGR 401	Farm Practice IV	0	0	1	1
					20

RAIN SEMESTER

		Contact Hours			
		L	T	P	U
SIWES 400/401	Industrial Attachment	0	0	6	6
					6

500 LEVEL

HARMATTAN SEMESTER

		Contact Hours			
		L	T	P	U
FWT 501	Forestry/Wildlife Land Use Systems	2	0	0	2
FWT 503	Forest Economics & Management	1	0	1	2
FWT 505	Forest & Wildlife Policy, Law & Admin	2	0	0	2
FWT 507	Silviculture	1	0	1	2
FWT 509	Forest Soils & Plant Nutrition	1	0	1	2
FWT 511	Forest Genetics & Tree Breeding	1	0	1	2
FWT 513	Forest Pests, Diseases & Forest				
	Protection.	1	0	1	2
FWT 515	Wood Production Technology	1	0	1	2
FWT 517	Research Project I	0	0	2	2
AGR 501	Farm Practice V	0	0	1	1

ELECTIVE

CST 501	Weeds & Weed Control	2	0	0	2
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CST 511	Farming Systems in the Tropics	2	0	0	2
					19

RAIN SEMESTER

		Contact Hours			
		L	T	P	U
FWT 516	Research Project II	0	0	4	4
FWT 514	Pulp & Paper Technology	1	0	1	2
FWT 504	Environmental Impact Assessment	1	0	1	2
FWT 506	Forest & Wildlife Biometrics	2	0	0	2
FWT 510	Forest Industry & Quality Control	2	0	0	2
FWT 512	Wildlife Management & Utilization	2	0	0	2
AEX 506	Rural Community Development	2	0	0	2
FWT 500	Student Seminar	0	0	1	1
FWT 502	Management of Game Birds	1	0	0	1
Elective					
AEC 504	Agricultural Project Management Evaluation	2	0	0	2
AEX 510	Practice in Extension Methods And Audio-Visual Aids	1	0	1	2
					18

YEAR 1: HARMATTAN SEMESTER

PHY 101: GENERAL PHYSICS 1 (2, 1, 1)

Mechanics; Space and time, units and dimensions; Vectors kinematics, Newton's laws; Galilean invariance; statistics and dynamics of particles; universal gravitation; work and potential energy ; conservation of energy and momentum; rigid bodies fluid mechanics. Thermal physics; thermal properties, including elementary thermodynamics and kinetic theory.

Pre-requisite; Credit in O/L physics.

CHM 101: GENERAL CHEMISTRY 1 (2, 1, 1)

Chemical reaction , equations and stoichiometry, Atomic structure and the periodic classification of element. Electronic theory of atoms. Radioactivity. Ionic and covalent bonds. Solids and their structure.

Dipole interactions and its effect on physical properties. Redox reaction. Equilibrium. Elementary electrochemistry. Introduction to kinetic properties of gases, Basic chemical kinetics and chemical thermodynamics, principles of metal extraction.

Pre-requisite: Credits at WASC/GCE O/L Chemistry

MTH 101: ELEMENTARY MATHEMATICS I (3, 1, 0)

Number systems. Indices, Surds and Logarithms. Polynomials. Remainder and factor theorem. Polynomial equations. Partial fractions. Field. Ordered fields. Inequalities. Mathematical induction. Permutations and combinations. Binomial theorem. Sequences and series. The quadratic equation and function. Relation between the roots and the coefficients. Complex numbers. Addition, subtraction, multiplication and division. Argand diagram. De-Moivre theorem. n -th roots of complex numbers. Elementary set theory. Venn diagrams and application of De-Morgan's laws. Trigonometry. Elementary properties of basic trigonometric functions. Addition formulae and basic identities. Sine and cosine formulae. Half angle formulae. Area of a triangle. Solution of trigonometric equations. Inverse trigonometric functions. Functions. Concept and notation. Examples composition, Exponential and logarithmic functions. Graphs and properties. Limits and continuity. Techniques for finding limits. The derivative. Calculations from first principles Techniques of differentiation. Chain rule. Higher order derivatives. Extreme problems. Mean value theorem. Applications. Indeterminate forms and L'Hopital's rule. Taylors and Maclaurin's series. Curve sketching. Integration as the inverse of differentiation, as area, as limit of finite sums. Applications.

Pre-requisite: Credit O.L. Mathematics

BIO 101: BIOLOGY FOR AGRICULTURE AND BIOLOGY 1 (2,0,1)

Common life forms and processes, the nature, characteristics and diversity of living organisms, along with a general treatment of process of evolution. Cell structure and cellular metabolism including respiration, growth and cellular transport. A general treatment of ecology and how living organisms relate to their

environment and to each other. Form and function in plants: A general classification of plants with emphasis on the families of higher plants that are of economic importance; general angiosperm morphology and anatomy. The process of photosynthesis, reproduction inorganic nutrition, growth and development in higher plants.

Pre-requisites: Credits at WASC/GCE/O/L Biology.

GST 101: USE OF ENGLISH I (1, 1, 0)

Library orientation, study aids through dictionary practice, vocabulary development techniques, reading and comprehension techniques, listening and note-taking techniques outlining and summarizing, dealing with examination questions. Special types of exposition- e.g letter writing. Layout of a business letter, technical reports including terms of reference, drafting and editing of reports.

ENG 101: WORKSHOP PRACTICE 1 (0, 0, 1)

General: Use of engineering measuring instruments Calipers e.g. Vernier Calipers; Gauges e.g. Micrometer; Screw gauge and other devices. Introduction to hand tools, proficiency in the use of wood planer, Hand Saw, Sanders and Pattern Making.

Sheet Metal Work: Production of sheet metal products layouts, cutting, shaping, simple bend theory. Introduction to joining techniques: Soldering, brazing, fusion welding, fastening and assembly.

Wood work: Basic woodworking principles and tools finishing and evaluation of finished products.

ENG 103: ENGINEERING DRAWING 1 (0, 0, 1)

Introduction to the use of drawing/drafting instruments. Descriptive geometry and geometric constructions. Drawing, measuring, lettering and dimensioning. Objects in various positions. Principles of orthographic projection in the first and third angle.

GST 103: HUMANITIES, PHILOSOPHY AND LOGIC I (1, 0, 0)

Introduction to humanities, definition and rationale. Role of literature in the humanities aspects of the contemporary African novel; significant examples of African/Western poetry; dramatic art role and relevance in modern Nigeria with practical demonstrations/performances. Roles of philosophy in the humanities, man and his quest for certainty; materialism, idealism; the meaning and significance of selected concepts freedom, responsibility, obligation, the "good life", art beauty; values relative and non-relative; inductive arguments and scientific reasoning. Exposure to African History its role and relevance, African art and music its history and development, Religion and the meaning of life-past, present, and future.

YEAR 1: RAIN SEMESTER

PHY 102: GENERAL PHYSICS II (2, 1, 1)

Electricity: Electrostatics; charge and matter, the electric field, gauss's law, electric potential, capacitors and di-electrics. Current electricity; current and resistance, Ohm's law, electromotive force and circuits, RC circuits. Magnetism: managetostatics; the magnetic field, Ampere's law, Faraday's law of induction, inductance, LR circuits. Magnetic properties of master. Sound and optical properties.

Pre-requisites: Previous registration in PHY 101 and MTH 101.

CHM 102: GENERAL CHEMISTRY II (2, 1, 1)

Organic formulae and structure. Homology and Isomerism. Concept of hybridization. Survey of reactions of functional groups in Aliphatic and Aronatic compounds. Introduction to the chemistry of Alkanes, Alkanes, Alkeynes, Halokanes Alkanols, Ethers, Amines, Aldehydes, Kotones, Carboxylic acids and their derivatives.

Pre-requisites: Credits at WASC/GCE/O/L Chemistry.

MTH 102: ELEMENTARY MATHEMATICS II (3, 1, 0)

Transcendental functions. Hyperbolic functions. Inverse functions. Logarithmic differentiation. Integration by substitution, integration by parts. Improper integrals. Applications. Areas and volumes. Centre of mass. Ordinary differential equations. First-order equations with variable separable. First order linear equations. Second order homogenous equations with constant coefficients. Applications. Plane analytic geometry. Rectangular Cartesian co-ordinates. Distance between two points. Straight line. Loci. The circle, parabola, ellipse and hyperbola. Second degree curves Plane polar co-ordinates. Vectors: Vector addition and multiplications. Products of three or more vectors. Vector functions and their derivatives. Velocity and acceleration. Matrix algebra. Addition and multiplications. Transpose. Determinants. Inverse of non-singular matrices. Cramer's rule and application to the solution of linear equations. (Examples should be limited to $m \times n$ matrices where $M=3$, $N=3$.). Transformations of the plane, Translation, reflection, rotation, enlargement, shear, composition of transformations. Invariant points and lines.

Pre-requisites: Credit 0/L Mathematics.

BIO 104: BIOLOGY FOR AGRICULTURE AND BIOLOGY II (1, 0, 1)

Form and function in animals. A general classification of animals with emphasis on the characteristic morphology and anatomy of the economically important groups, such as *Mammalian*, *Aves*, *Piscies*, *Arthropods*, *Mollusca* and *Nematoda*.

Discussion of the following processes in animals: nutrition, excretion, reproduction, movement and confirm regulation.

ENG 102: WORKSHOP PRACTICE 11 (1, 0, 1)

Machine shop work: lath work, instruction and working process, shaping, milling, grinding, reaming and metal spinning etc. design of simple jigs and fixtures. Finished products, sample techniques.

GST 102: USE OF ENGLISH II (1, 1, 0)

Vocabulary, use of classical terms, word formation and affixes,

special terms, acronymns, choice of correct words, definitions by examples, synonym or antonym, analytic or operational definitions, basic words in fields of specializations e.g. mechanical, electrical, civil, aeronautical, automobile engineering, metallology, mathematics

GST 108: SOCIAL SCIENCE I (1, 1, 0)

This covers the nature and scope of politics and economics. From the basic concepts in economics and political science to the political set-up in Nigeria, the civil service structure, public investment and economic infrastructures to fiscal federalism and revenue allocation. A global perspective of economics; economic systems and development nations' economics. International trade and economic development; Balance of payments, commercial policies of Nigeria and other developing countries. Economic integration; state and structure of economics of ECOWAS countries, the ECA and countries, the ECA and economic co-operation in Africa. Foreign aid and investments: the multinational corporations, technological dependence. Global inter-dependence and the New International Economic order. World economic crises energy and OPEC, food storages and armament.

GST 110: SCIENCE TECHNOLOGY AND SOCIETY I (1, 0, 0)

The scientific evolution of man science, need, history, classifications, and modern scientific methods; science and mans environment Terrestrial and cosmic Life; harnessing science climate and vegetation. Production, processing, conservation, distribution; energy resources solar, thermal, nuclear energy fossil fuels, estimates of energy reserves in Nigeria.

YEAR 2: HARMATTAN SEMESTER

CSC 201- COMPUTER AND APPLICATIONS (2,1,1)

Brief history of computers and computer generation. Classification of computers. Structure of a general purpose computer, number systems. The stored program. Techniques of

problem solving. Flowcharting, stepwise refinement. Algorithm for sorting and merging of ordered lists. Data preparation I/O devices. Data types. Data representations. Data capture. Problem-oriented languages. Basic and fortran programming. Logic expression. Arrays, sequencing, alteration and iteration, numerical algorithms.

PREREQUISITES; MTH 101 OR MTH 102

MTH 211- STATISTICS (2,1,0)

Frequency distributions, measures of location and dispersion in simple and grouped data. Laws of probability. The binomial, poisson and normal distributions. Estimation and tests of regression and correlation, contingency tables and χ^2 -applications.

PREREQUISITES; MTH 101 OR 102

AST 201: PRINCIPLES OF ANIMAL PRODUCTION (1, 0, 1)

Introduction to the anatomy, physiology, genetics, breeding, nutrition, health economics and management of the major tropical farm animals. Specific treatment will be given to cattle, sheep, goat and rabbit production.

PREREQUISITES: BIO 101/103

AGR 203: Introduction to Agriculture (1, 0, 1)

Forestry Aspect
Definition of Forest, Relationship between Forestry and Agriculture
Different Forest types in Nigeria
Timber and Non-timber products and their uses functions of forest
Ownership of forest lands in Nigeria.

AGR 205- AGRICULTURAL CHEMISTRY (1, 0, 1)

Chemistry of the s- block elements and the representative block elements. Brief introduction into the chemistry of first series

transition elements. Structure, reactions and functions of hydrocarbons, alcohols, phenols, aldehydes ketones, organic acids and their derivatives. Atomic structure and bonding. Periodic table. Colloids, chemical kinetics and equilibrium. Oxidation and reduction. Acids, bases. Properties and reactions of elements of importance in agriculture.

AEX 201- AGRICULTURAL EXTENSION AND RURAL SOCIOLOGY (2,0,0)

The need for agricultural extension; agricultural extension in Nigeria and the world. Basic philosophy behind extension work, institutional setting for agricultural extension. Agricultural development agencies, communication and extension teaching processes, adult education principles, practicals and selected oral and written communication methods and audio-visual aids (AVAS).

AGR 207: Agriculture Biotechnology (1, 0, 1)

- A. What is Biotechnology? Definition and its importance. History of domestication and Agriculture. Ancient plant germplasm. Fermented foods and beverages [History]
- B. Classical Biotechnology
- C. Foundations of Modern Biotechnology. Early Microscopy. Development of cell theory
- D. Nature of the gene. First Recombinant Experiments. First DNA Cloning Experiment 1
- E. Plant and Tissue Culture and Applications. Plant Tissue Culture. Micro propagation
Other users of Tissue Culture
- F. Plants Genetic Engineering. Plant transformation and Agrobacterium tumefaciens.
Challenges of foreign Gene Expression
- G. Applications of plant Genetic Engineering. Crop improvement. Forestry-tree improvement. Genetically Engineered Traits. Genetically Engineered Foods. Nutritionally Enhanced plants. Molecular Farming
- H. Gene Transfer Methods in Animals. Microinjection. Embryonic stem cell Gene Transfer. Retrovirus and Gene Transfer

- I. Transgenic Animals and their Application. Mice, Cows, Pigs, Sheep, Goat and Birds
- J. Animal Health
- K. Animal Propagation: Artificial Insemination. Animal Clones.
- L. Regulation of Transgenic Animals
- M. Patenting Genetically Engineered Animals
- N. Aquaculture: Gastropod, Bivalves and Crustacean production
- O. Marine Animal Health
- P. Algae products.
- Q. Fuels from Algae
- R. Medical Applications: Marine Natural Products and their medical potentials. Anticancer and Antiviral compounds. Antibacterial Agents. Marine Toxins
- S. Transgenic Fish.

AGR 209: AGRICULTURAL ENTREPRENEURIAL STUDIES (2,0,0)

Introduction to entrepreneurship, new venture creation, entrepreneurship in theory and practice, opportunity, entrepreneurial team, entrepreneurial finance, raising financial capital, marketing and the new venture, innovation, new venture workshop, growth and harvest.

GST 201: NIGERIAN AND AFRICAN CULTURAL DEVELOPMENT SOCIAL SCIENCE II (1, 0, 0)

Concept and meaning of development; traditional Africa's geographical and ethnographical review, family structure, kinship system, socio-economic pre-occupations, political systems, art and music, modes of communication etc.; African and processes of modernization education, writing and the press, urbanization and social change, modern trends in art and aesthetics, nationalism and cultural revival, mass media and national development.

YEAR 2: RAIN SEMESTER

CST 204: FIELD CROP PRODUCTION (2, 0, 1)

Detailed treatment of the major field crops, yam, cocoyam, cassava, sweet potato, maize, rice, sorghum, beans, groundnuts, winged

beans, sugar cane, tobacco etc. for each crop, there will be detailed discussions of time of planting, site selection, land preparation, planting materials, seed rate, spacing, mulching, fertilization (type rate and frequency), crop protection (weed, pest and disease control), harvesting, processing and storage.

FWT 202: PRINCIPLES OF FORESTRY RESOURCES & WILDLIFE MANAGEMENT (1, 0, 1)

Definition of forestry terms.

Differences between forest and forestry. Renewable natural resources, availability, distribution and potentials. Grazing, Land, Fallow lands, forests and game reserves, national parks and other conservation stands.

Components of Renewable Natural Resources

Plants, Wildlife, water resources, forest soils etc.

Forest Exploitation and Utilization.

Logging and log transportation.

(skidding, and Haulage, Road and water transportation)

Sawmills and types, types of wood products.

World Distribution of tropical forests based on climate.

Different Nigerian vegetation (forests and savannah).

Nigerian wildlife species.

Sustained yield Management.

Forest management plan and its importance in forest management.

Introduction to forest ecosystem.

Stable and unstable ecosystem.

Difference between forest and agro-ecosystem.

AEC 202: PRINCIPLES OF MICRO AND MACRO ECONOMICS (1,1,0)

Scope and methods of economics. Price theory including the theory of demand and supply. Theories of production and distribution. National income determination. Monetary theory of international trade. Theory and economic growth, development and policy.

Fundamental treatment of demand and supply. Theory of production, pricing and employment resources. Introduction of different fields of agricultural economics, marketing, credit and finance, resource economics, project analysis.

SST 202: PRINCIPLES OF TROPICAL SOILS (1,0,1)

Fundamental discussions on the distribution and classification of tropical soils. Their physical, chemical and biological properties. Their relationship with crop productivity.

CST 206: AGRO- CLIMATOLOGY AND BIOGEOGRAHY (1, 0, 1)

The concept of meteorology. Branches of meteorology and importance. Concept of weather and climate and their elements (measured, derived and proxy elements). Control of weather and climate. Radiation and energy budget: Heat budget, Temperature inversion and environmental lapse rate. Seasonal/spatial variations in temperature. Pressure and wind system, condensation and precipitation, ITCZ, Measurements and recording.

Climate and soil formation. Climate and pest/disease. Relationship between climate variations and crop production.

Phenology, crop growth response to weather and climate.

Stages in crop/livestock life and their different climatic requirements.

Functions of agrometeorological services. Climate and land use planning. Climate and water resources management. Climate and livestock.

Protecting crops/livestock from adverse weather.

AST 202: PRINCIPLES OF ANIMAL PRODUCTION (1, 0, 1)

Introduction to the anatomy, physiology, genetics breeding, nutrition, health economics and management of the major tropical non-ruminant farm animals. Specific treatment will be given to various kinds of poultry, as well as swine.

FAT 202: PRINCIPLES OF FISHERIES AND AQUACULTURE (1,0,1)

External morphology: Difference between bony and cartilaginous fishes. Identification, distribution and life history of selected fin fish and shell fish. Food and feeding habitat of fish according to the different niches. Classification of fish in relation to salinity, classification of aquatic habitat in relation to depth. Definition of fisheries management. Dynamics of fish population. Management procedures. Restrictive laws, artificial propagation, introduction and habitat improvement, natural and artificial selection and management.

AGR 204: AGRICULTURAL BIOCHEMISTRY (1,0,1)

Cellular composition and morphology. Chemistry, metabolism and synthesis of carbohydrates, lipids and proteins. Importance of PH and buffers. Structure and functions of enzymes.

AGR 202: FARM PRACTICE 1 (0, 0, 1)

Students will be required to be intimately involved in the performance of various farm operations and farm records.

Skills will be taught in various farm operations in

- a. Crop production
- b. Fisheries
- c. Forestry
- d. Animal Husbandry and
- e. Village extension teaching methods.

YEAR 3: HARMATTAN SEMESTER**AST 301: INTRODUCTION TO TROPICAL ANIMAL HEALTH (2, 1, 0)**

Introduction to the occurrences, economic impacts, causes (including environmental) etiology, treatments and methods of prevention of common diseases of livestock in the tropics. Emphasis will be placed on practical health management techniques against these diseases.

AGR 303: AGRICULTURAL GENETICS (2, 0, 1)

Elaboration of the general principles applicable in agricultural production, with specific discussions on Mendelian genetics including functions, nature and structure of genes. Basic concepts in the genetics of populations and quantitative traits of economic importance in plants and animals. Rudiments of selection; and an introduction to breeding objectives and priorities in agriculture. Objectives as yield, quality resistance, adaptation, stress tolerance and mechanizability will be highlighted. Practical and field illustrations of these concepts will be emphasized.

Prerequisites: Bio 104

AGE 301: FARM PLANNING AND STRUCTURES (1, 0, 1)

Introduction to farmstead and farmstead problems. Consideration

for size and siting of farms. Procedure for planning the layout of facilities. Types of farms private, collective, Government. Integrated study of farms houses- beef/cattle, dairy cattle, hogs, sheep and goats, and poultry housing. Farm bunker and soils with consideration for heat requirement, generation and movement.

FWT 303: RESOURCE INVENTORY AND MENSURATION (2, 0, 0)

Definition of menstruation. Measurement of single tree parameters: Cross-sectional , height, form or shape, bark log and tree bole volume. Instruments used for measuring trees and crops or stands. Planning and execution of forest inventory. Statistical principles in forest inventory. Site assessment. Tree growth methods. Forest and wildlife resource sampling and enumeration techniques.

FWT 309: ENVIRONMENTAL DEGRADATION AND RECLAMATION (2, 0, 0)

Factors that cause environmental degradation such as: high salinity of the coastal areas, erosion, petroleum, pollution, gas flaring, excessive logging, slash and burn agriculture with short fallow period, descertification and mining activities etc. Methods of reclaiming degraded environment such as: Afforestation programmes , waste disposal methods, recycling or re-use of waste and water. Landscaping and ornamental horticulture.

FWT 305: FOREST ECOLOGY (2, 0, 0)

Ecology of the different vegetation types in Nigeria. Extent, structure and composition of the different vegetation types in Nigeria. Climatic characteristics of these vegetation zones (rainfall, temperature, relative humidity, evapo-transpiration, energy balance, albedo) etc. Factors affecting the growth and productivity of trees, Leaf Area Index (LAI). Effects of human activities on the micro-climate of different forest types. Relationship between litter fall and nutrient/carbon cycling. Seasonality/biomass, litter decomposition, nutrient uptake and soil development. Composition, structure and functions of forests and savannah.

Species composition and phonology, tree/wildlife population dynamics. Girth classes of trees in different forest types. Effects of fire on vegetation and soils. Fire danger index, regeneration of trees and grosses, nutrient release in soils.

Various stages of savanna development through fire activities.

FWT 307: WOOD BIOLOGY (2, 0, 0)

Primary and Secondary growth in woody species that lead to formation of wood.

Activities of special meristem and vascular cambial.

Cambial initials responsible for wood formation divisions o cambial initials resulting in tree growth or wood formation. External and internal factors that promote wood formation.

Activities of the cork cambium Growth and development of monocotyledons. Brief description of physical, anatomical, chemical and mechanical properties of wood.

Advantages of wood in building and construction.

Use of wood properties for wood identification.

FWT 311: WILDLIFE TAXONOMY AND BIOLOGY (2, 0, 0)

Demographic characteristic of wildlife populations and techniques of estimating growth and regulation of wildlife population in forest and savannah ecosystems.

Study of various wildlife communities and their ecological framework Wildlife productivity in forest and savannah ecosystems. Disturbances in wildlife habitats and ecosystems. Gap dynamics and competition in wildlife ecosystem

Modern concepts in wildlife ecology and ecological census.

Taxonomy and its significance. Principles and concepts in wildlife taxonomy, construction of and use of taxonomic keys.

AGR 301: FARM PRACTICE 11 (0, 0, 1)

Practical illustration and do- it- yourself involvement of students in the agricultural practices of crop pests and disease control, harvest, storage and processing, fertilizer and their application

Agricultural price data collection

Demonstration and communication techniques in extension
Handling, housing, feeding and disease control in sheep, goats and rabbits. Wild and Aquatic life.

FWT 301: INTRODUCTION TO SILVICULTURE (2, 0, 1)

Definition of silviculture. Growth and development of trees. Analysis and study of problem of raising tree crop. Natural and artificial regeneration. Nursery techniques. Climatic and edaphic factors affecting tree growth, tropical regeneration methods. Application of silvicultural principles for establishment and maintenance of forests for various purposes. Taungya and other silvicultural practices.

YEAR 3: RAIN SEMESTER

AGR 306: PROCESSING AND STORAGE OF AGRIC. FOOD PRODUCTS (2, 0, 1)

Preliminary and preparatory opportunities of raw materials.
Selection, sorting, grading and storage Basic methods of food practices in thermal and low temperature preservation
Harvesting and pre-processing of fruits and vegetables including
Size reduction
Canning
Fermentation
Freezing and
Dehydration

AGE 302: AGRICULTURAL MACHINERY AND MECHANISATION (2, 0, 1)

Short review of the development of agricultural machines. Historical development of tractor types, makes and features.
Principles of operation and adjustment of tractors. Uses in various farm operations. Tractor hitch, linkage and control. Types of drive and power transmission. Introduction to field implements, their uses and modes of operations.

AGR 304: AGRICULTURAL STATISTICS AND BIOMETRY (3, 0, 0)

Introduction to simple linear models in agricultural research and their utilization in the design and analysis of farm experiments. Particular emphasis will be placed on the formation of appropriate

experimental designs and analysis of variance and covariance for completely randomized designs, randomized block designs. Latin square design and factorial experiments. Estimation of variance components, regression and correlation coefficients and simple test statistics will be discussed. Recent advances in bio-statistics will be highlighted as well as introduction to the development of computer-assisted capability for analysis of farm data.

FWT 302: FOREST ENGINEERING (1, 0, 1)

Design, construction and maintenance of forest roads (access and feeder roads), bridges, drains, dams and building, logging, tree felling, bucking for log, production, minor log transportation, different methods of log skidding, loading, off loading major transportation methods, such as log transportation on water surface, that is, rafting, transportation by truck and rail. Planning analysis and supervision of forest engineering operations.

FWT 304: FOREST AND LAND SURVEY (1, 0, 1)

Introduction to surveying; methods and purpose information on forest area from different kinds of survey methods.

Preparation of maps from aerial photographs, equipment and facilities used for aerial photography interpretation for aerial photographs and satellite imagery.

Land/ground survey equipment. Boundary and topography survey of selected project areas. Seribing, type, preparation and mapping of forest aerial and ground survey.

FWT 306: FOREST OPERATION 1 (1, 0, 1)

Planning in forestry. Different stages for forest road construction

Forest road policy, logistics (use of maps as a planning aid)

Preliminary preparation for forest road construction (reconnaissance, design, costing, clearing, grubbing etc) forest road maintenance. Construction of bridge and culvert.

Construction of forest camp and the materials involved.

FWT 308: NATURAL ECOSYSTEMS (2, 0, 0)

Survey of the structure and function of the major vegetation types in Nigeria and globally.

Types of natural ecosystems (forests, savanna, pastures, rangelands, deserts, mangroves, swamps etc) and their eco-zones.

Qualitative and quantitative analysis of forest plant communities.

Patterns, ordination and classification of natural forest ecosystems.

Analysis of vegetation and environmental factor relationships.

Management of forest and savanna ecosystems.

Analysis of competition in plant communities. Environmental degradation and remediation factors in natural forest ecosystem.

Sustainable management techniques of natural forest ecosystems.

Distribution, structure and dynamics of land and fresh water ecosystems.

The flow of energy and materials through natural ecosystems. Tree species unique to different ecosystems.

FWT 312: PRINCIPLES OF WILDLIFE NUTRITION AND MANAGEMENT (1, 0, 1)

Principles of wildlife and forest food resources. Nutrient composition and nutrient values and forest food resources. Nutrient requirements for various wildlife physiological processes. Feed formation and ration preparation. The role of nutrition in the survival and population dynamics of wildlife in their natural habitat. Consideration would be given to the following species (*artiodactyla*, *insectivore*, *lafamorphis*, *Elephantidae*, *Arthropoda*). Storage, processing and preservation of fodder and wildlife food resources for domesticated wildlife.

AGR 302: FARM PRACTICE III (O, O, 1)

Preparation of herbarium materials (plant pressing)

Key to plant taxonomy

Nursery practice

Soil mixture, potting and pre-treatment of seeds Nursery layout

YEAR 4: HARMATTAN SEMESTER

FWT 413: WOOD PROCESSING, PRESERVATION & UTILIZATION (1, 0, 1)

Survey of different local and scientific methods of preservation and utilization of different wood products for different purposes.

Felling of trees and processing wood in different wood-based industries and charcoal production.

FWT 401: INTRODUCTION TO LAND USE PLANNING (1, 0, 0)

Studies on the integrated use of land for forestry, wildlife, fisheries and agricultural purposes. Nigerian land resources. Attitudes and conflicts. Strategies for resolution of land conflicts. Formation of management policies for land areas. Decision making in the allocation of land for forestry, wildlife, fisheries and agriculture. Land capability classification. Legislations relating to land and environmental planning.

MGT 405: TECHNICAL REPORT WRITING (2, 0, 0)

The features of a report:

- a. Introduction
- b. Materials and Methods, including data collection, data analysis
- c. Results presentation
- d. Discussions
- e. Conclusion would be taught. Students would be exposed to the techniques/practice of report writing.

FWT 403: AGROFORESTRY TECHNOLOGY (1, 0, 1)

Definition and history. The importance of agroforestry including sustainable production of food and fibre, environmental protection, conservation and management. Major agroforestry systems including taungya system (traditional and departmental taungya), alley farming systems, home gardens, shelterbelt or windbreaks etc. Components and classification of agroforestry systems.

- e.g. (a) two-component systems such as (i) trees and arable crops (agrisilviculture), (ii) trees and livestock (silvopastoral system) etc
(b) three-component systems such as (i) trees, arable crops and livestock (agrosilvopastoral system) etc.
(c.) Others such as agriculture with trees, arable crops and/or livestock. Socio-economic feasibilities and limitations.

FWT 405: GROUND/AERIAL SURVEY PHOTOGRAMMETRY (1, 0, 1)

Preparation of maps from aerial photographs, ground survey instruments. Boundary and topographic survey of selected

project areas. Scribing, type preparation and mapping of aerial and ground survey. Practical use of some remote sensing equipment and techniques. Preparation of maps from information from remote sensing.

FWT 417: URBAN FORESTRY (1, 1, 0)

Urbanization trends and management policies in Nigeria. Urban environmental problems in Nigeria. Concept of urban forestry. Historical developments of urban forestry in the developed world. Types of urban forestry: trees in residential areas, greenbelt and greenways, roadside planting, urban agriculture, watershed management, riverside planting etc.

Role of urban forestry in environmental management. Basic requirements for developing urban forestry programme. Legal framework, institutional feasibility, technical viability and environmental sustainability.

FWT 407: ZOO AND PARK MANAGEMENT TECHNOLOGY (1, 0, 1)

Basic objectives of zoo and park planning. Field training in selected zoological gardens and national parks. Organization and administration of zoo and parks. Practical exercises in anti-poaching, boundary demarcation and road development. Development and design of zoo and park facilities. Care of wildlife in captivity. Amusement infrastructure. Zoo sanitation and control of zoo visitors. Feeding of zoo animals.

FWT 409: MUSEUM AND HERBARIUM MANAGEMENT (1, 0, 1)

Design of storage facilities for

- (a) Precious materials usually preserved in museums
- (b) Plant materials of research and industrial importance. Visit to selected museums and herbaria in Nigeria.

FWT 411: FORESTRY/WILDLIFE ECOLOGICAL SURVEY (1, 0, 1)

Management/care of trees and wildlife in their natural environment/habitat. Tree species' distribution in relation to their environment. Wildlife distribution in relation to their environment

and natural resources. Wildlife food preferences, behavioural patterns etc. Growing plants of importance to wildlife. Evaluation of man's impact on terrestrial and aquatic ecosystems.

FWT 415: FOREST OPERATIONS II (0,0,2)

Forest concession: types, advantages and criteria for payment of concession in Nigeria. Plywood and timber harvesting:

Operations involved features and working principles, undercut and backcut, sequence and methods of harvesting.

Lambing and crosscutting specifications for high quality logs.

Skidding (cable yarding and tractor skidding)

advantages/disadvantages of ground skidding, pan skidding, arch unloading harvested products.

Methods and basic principles in hand loading, gravity loading, cross-haul loading, stationery loading.

Haulage methods. Timber production management.

YEAR 5: HARMATTAN SEMESTER

FWT 501- FORESTRY/WILDLIFE LAND USE SYSTEM (2,0,0)

Nigerian land resources; attitudes and conflicts. Integrated policies for land areas. Decision making in the management policies for land areas for forestry purposes, wildlife purposes and other land based activities. Legislations on land as they relate to forestry and wildlife.

FWT 503: FORESTRY ECONOMICS AND MANAGEMENT (1, 0, 1)

Principles of sustained yield.

Yield control and management for optimization of set objectives.

Systems approach to forest management. Use of analytical procedures in forest management and utilization decisions. Forest goods and services.

Market trends and factors affecting their demand and supply.

Application of economic principles to decision making in forestry.

Project evaluation. Forestry and economic development.

FWT 505: FORESTRY AND WILDLIFE POLICY, LAW AND ADMINISTRATION (1, 0, 1)

Nigeria forest, wildlife and conservation policies together with other related natural resources policies.

Forest legislation and administration and their evolution from colonial days. Planning effective use of forest resources

Structure of wildlife administration.

Problems of conserving forest and endangered species.

Nigerian law in natural ecosystems

Legislation for wildlife and other natural resources.

FWT 507: SILVICULTURE (1, 0, 1)

Silviculture for natural forests. Major forest types of the tropics and silvicultural systems applied to them.

Practices that enhance the regeneration of natural forest: climber cutting, enrichment planting, fire-tracing etc.

Silviculture for forest plantations. Principles underlying choice of species and provenance (provenance trials); seed technology, with special reference to tree species.

FWT 509: FOREST SOILS AND PLANT NUTRITION (1, 0, 1)

The importance of forest soils in tropical agriculture. Soil formation, soil classification, forest soil physics, chemistry, microbiology, moisture movement etc.

Soil dynamics. Influence of soil on forest composition and distribution.

FWT 511- FOREST GENETICS AND TREE BREEDING (1,0,1)

Concept of basic genetics. Chromosome structure and function. Genes, DNA etc. problems particular to forest genetics. Inventory, selection and conservation of forest genetic materials for mass production of improved strains. Theory/practice of methods and benefits of tree breeding and improvement principles underlying choice of species. Quantitative genetics of forest tree improvement. Economics of tree breeding programs. Principles, establishment and management of seed orchard.

FWT 513- FOREST PEST/DISEASES AND FOREST PROTECTION (1,0,1)

Taxonomy and biology of major pests and diseases of forest trees.

Method of assessing tree condition. Forest decline. Principles

underlying disease and pest control. Genetics and environmental control. Forest use and control. Protection against encroachment. Diseases and illegal felling.

FWT 515: WOOD PRODUCTION TECHNOLOGY (1, 0, 1)

Silvicultural techniques for high quality wood production. Wood quality of living trees, choices of species via provenance, site, genotype, rotation.

Production of wood to meet the demands of different wood-based industries

Saw-milling, poles, wood-based panel, pulp and paper, fuel wood industries.

Characteristics of species and the tending operations in the production of different tree/shrub species for different end purposes.

FWT 517: RESEARCH PROJECT II (1, 0, 1)

Supervision and study of an identified problem, requiring both oral & written presentations.

Student must participate in tutorial research technique and scientific writing as well as oral presentation relating to student's projects in the school.

AGR 501: FARM PRACTICE V (0, 0, 1)

Skills will be taught and demonstrated on different agricultural farm practices. This would be supplemented by visits to agricultural establishments for familiarization of the practices by the students.

Techniques of the following would be taught and demonstrated:

- a. Plant spacing and orchard layouts
- b. Manure and compost making
- c. Weed soil conservation techniques
- d. Antemortem inspection and slaughter management in animals
- e. Questionnaire design and conduct of interviews.

YEAR 5: RAIN SEMESTER

FWT 514: PULP AND PAPER TECHNOLOGY (1, 0, 1)

Pulpwood species and their wood characteristics.

Processing of logs prior to pulp production (backing to produce standard bores, debarking, chipping etc). pulping methods: mechanical, chemical and semi-chemical methods.

Pulp preparation prior to paper production (screening, bleaching, machining, beating, gluing, preservation, coaching and filling, sizing, dyeing and finishing) paper products, paper grading.

FWT 504: ENVIRONMENTAL IMPACT ASSESSMENT (1, 0, 1)

Definition, principles and procedures of Environmental Impact Assessment (EIA). Environmental impact of human actions. Response of societies to environmental charge. Contents of EIA.

Introduction to Rapid Appraisal Techniques

Case studies/practical examples.

FWT 506: FOREST AND WILDLIFE BIOMETRICS (2, 0, 0)

Advanced sampling methods in inventory. Volume estimation and volume table deconstruction. Growth increment determination. Construction of management table. Practical concept in the design and analysis of experiments on tree crops and wildlife problems.

Processing of resource inventory and mensuration data for management purposes. Application of multivariate analysis to forestry and wildlife. Basic techniques in survey sampling and design.

FWT 510: FOREST INDUSTRY AND QUALITY CONTROL (2, 0, 0)

Forest based industries including furniture, saw mills, plymills, fibre board, clipboard and particle board while determination of timber quality and its control, inspection, sampling and grading, wood protection, minor forest brewed industries e.g. charcoal production, cellulose derivatives industry, marketing of forest resources, setting of forest industries.

They are:

- (a) **Student Workload:** This is defined in terms of course unit system. One unit represents one hour of lecture or one hour of tutorial or 3 hours of practical work per week throughout a semester. Thus for example, a course in which there are 2 hours of lectures and 1 hour of tutorial per week is a 3 unit course.
- (b) **Grade Point (GP):** The grade point derives from the actual percentage or raw score for a given course; the raw score is converted into a letter grade ranging from A to F and a grade point ranging from 5 to 0.
- (c) **Total Grade Point (TGP):** This is derived from multiplying the grade point by the units per course and summing up the grade points for all the courses registered.
- (d) **Total Number of Units (TNU):** This is obtained by adding up all student units taken by the student in a semester. For example, a student who is carrying 6 courses of 3 units each has a TNU of 18 for that semester.
- (e) **Grade Point Average (GPA):** Performance in any semester is reported as a grade point average. This is the average of weighted grade points earned in the courses taken during the semester. The GPA is obtained by dividing the TGP by the TNU.
- (f) **Cumulative Grade Point Average (CGPA):** This is the up-to-date average of the grade points earned by the student in a programme of study. It is an indication of the student's overall performance at any point in the programme. To compute the CGPA, the TGP's for all the semesters are added and then divided by the TNU's for all courses registered by the students. Note that CGPA is not the summation of GPA's for all semesters. Both GPA, CGPA's obtainable range from 0 to 5.

Students are strongly advised to consult with their Class Adviser before registering for courses and for guidance on GPA and CGPA computations and other academic problems they may have.

8.2 EXAMINATION RESULT GRADING

Performance in a course shall be recorded in letter grades (after due conversion from percentage scores) as follows:

% SCORE	GRADE	GRADE POINT	EQUIVALENT
70-100	A	5	EXCELLENT
60-69	B	4	VERY GOOD
50-59	C	3	GOOD
45-49	D	2	PASS
40-44	E	1	POOR PASS
00-39	F	0	FAILURE

8.3 DEGREE CLASSIFICATION

CLASS OF DEGREE

1st Class Honours

2nd Class Honours (Upper Division)

2nd Class Honours (Lower Division)

Third Class Honours

Pass

Fail

CUMULATIVE GRADE POINT

4.50 5.00

3.50 4.49

2.40 3.49

1.50 2.39

1.00 1.49

0.00 0.99

9.0.0 ACADEMIC AND SUPPORT STAFF OF FORESTRY AND WILDLIFE TECHNOLOGY

9.1 ACADEMIC STAFF AND THEIR AREAS OF SPECIALIZATION

S/N	Names of Officers	Rank	Qualification	Specialization
1.	Prof. C. O. E. Onwuliri	Professor	B. Sc., Ph. D	Zoology/Parasitology
2.	Prof. J. C. Obiefuna	Professor	B. Sc., Ph. D	Agroforestry/Horticulture
3.	Prof. G. I. Nwankwor	Professor	B. Sc., M. Sc., Ph. D	Remote Sensing/Land Use.
4.	Prof. M. C. Ofor	Professor	B. Sc., M. Sc., Ph. D	Agroforestry/Farming
5.	Prof. R. C. Mbakwe	Professor	B. Sc., M. Sc., Ph. D	System Agroforestry/Silviculture
6.	Prof. L. C. Nwaigbo	Professor	B. Sc., M. Sc., Ph. D	Agroforestry/Land Use System
7.	Dr. F. N. Nnadi	Snr. Lect.	B. Sc., M.Sc., Ph. D	Agricultural Extension
8.	Dr. A. E. Ibe	Snr. Lect.	PGD, M. SC., Ph. D	Weed Science, Agroforestry/Env.
9.	Dr. Opeyemi Olajide	Snr. Lect.	B. Sc., M.Sc., Ph. D	Forest Ecology/Management
10.	Dr. H. M. Ijeoma	Snr. Lect.	B. Agric., M. Sc., Ph. D	Wildlife Management
11.	Dr. M. N. Opara	Lect. I	D.V.M, M. Sc.	Animal Health/ Wildlife Parasitology
12.	Dr. F. O. Ojiako	Lect. I	B. Agric, M. Sc., Ph.D	Forest Entomology
13.	Mr. P. C. Aju	Lect. I	B. Sc., M. Sc.	Forest Economics/Management
14.	Dr. H. A. Ikojo	Lect. II	B. Sc., M.Sc. Ph. D	Forest Ecology
15.	Dr. C. A. Udah	Lect. II	B. Sc., M. Sc., Ph. D	Forest/Wildlife Management
16.	Mr. Mac-Anthony Onyema	Lect. II	B. Sc., M. Sc.	Forest Extension/Social Forestry
17.	Mr. A. O. Umeojiakor	Asst. Lect.	B. Sc., M. Sc.	Soil Survey/Land Use
18.	Mr. E. C. Nwaihu	Asst. Lect.	HND, PGD, M. Sc.	Forest Economics
19.	Mr. C. N. Anyanwu	Asst. Lect.	B. Agric, Tech, M. Agric	Fisheries & Wildlife.
20.	Uluocha Blessing Ogechi	Asst. Lect.	B. Sc., M. Sc.	Forestry and Env. Management

1.	Mr. Akaerue C. I	AIST, ANIST, MNIST	Chief Technologist
2.	Mr. Okechukwu M. Ewurum	B. Sc (Microbiology)	Technologist II
3.	Miss Clara C. Ukaegbu	B. Tech (Agric.)	Farm Officer II
4.	Mr. Kelechi O. Onyema	B. Tech	Farm Officer II
5.	Mrs. Ugochi Ekwugha	HND	Prin. Agric. Supt
6.	Miss Ogechi Nkama	HND (Forestry Tech.)	
7.	Mr. Francis Iwueze	HND (Agric. Ext & Mgt.)	Higher Agric. Supt
8.	Mr. Uzoma C. D. Kamalu	HND (APT)	Higher Agric. Supt.
9.	Mrs. Blessing E. Okpe	HND (Agric. Ext)	Higher Agric. Supt
10.	Miss Beatrice Eze	SSCE, NCE	Farm Assistant
11.	Miss Odu Grace	SSCE	Farm Assistant
12.	Mrs. Patience Amuga	SSCE	Farm Assistant
13.	Mr. Vitus Onwuamaegbu	SSCE	Farm Assistant
14.	Mr. Felix Chikere	SSCE	Farm Assistant
15.	Mrs. Grace O. Igboke	GCE	Farm Assistant
16.	Mrs. Manya Ayuba	SSCE	Farm Assistant
17.	Mrs. Elfrida Nnokwara	SSCE	Farm Assistant

9.3 ADMINISTRATIVE AND SECRETARIAL STAFF

S/N	Names of Officers	Qualification	Status
1.	Mr. Solomon Uwakwe	B. Sc. (Econs)	SAR/DAO
2.	Mr. Peter A. Osuagwu	B. Sc. (Public Admin.)	CSA
3.	Mr. D. N. Dapchir	SSCE	DCCS
4.	Mr. Joshua Abara	SSCE, HND (Elect.)	Data Processor

Prepared and Compiled by
DR. A. E.IBE
 Pioneer Head of Department
 November, 2010

